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The Amateur Radio COMMUNICATOR

MAY/JUNE 1994 FOR THE NOVICE AND TECHNICIAN AMATEUR Volume 4 Number 3

- How To Understand Digital Communications
- How To Make A Telegraph Key
- FCC Says Repeater Trustees Can Ban Users
- Dan & Burke
- How To Work Satellites

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ON THE COVER

Two old-timers grace our cover this month. The human is Dick Esneault, W4IJC, a member of the original Project OSCAR team.

In the top photo, Dick is holding one of the very early structural engineering models of Amateur Radio's first artificial satellite, OSCAR 1. OSCAR was launched December 12, 1961, from Vandenburg Air Force Base as "piggy back" ballast on-board a military payload. OSCAR, which was solar powered, beeped its Morse message, "di-di-di-dit di-dit" to thousands of hams around the world. It is still in orbit, though it has long since gone silent.

In the lower photo, Dick is pointing at the OSCAR display at the 1993 National Convention in Huntsville, Alabama.

Photos courtesy of AMSAT-NA and Keith Baker, KB1SF.

The Amateur Radio Communicator

The Amateur Radio Communicator is published bi-monthly and is the official journal of the National Amateur Radio Association (NARA), P.O. Box 201407, Arlington, TX 76006.

The National Amateur Radio Association is incorporated in the State of Washington and is a non-profit organization as defined in Section 501(c)(3) of the Internal Revenue Service Code.

Organization Goals

The broad goal of NARA is to publicize Amateur Radio and to encourage people to become Amateurs by earning an entry level Novice or Technician Class license.

The organization has five specific goals within this broad framework. These are to a)publicize Amateur Radio to the general public, b)attract young people to the Amateur Radio Service, c)increase the stature and benefits of the Novice and Technician Class licenses, d)represent the interests of Novice and Technician Class Amateurs at the national level and 5)make all Amateurs aware that our radio frequencies are in jeopardy from commercial interests. More specifically:

A. NARA advertises in consumer publications to create public awareness of the Amateur Radio Service.

B. NARA is interested in encouraging young people to join our fraternity. A core of young people insures growth of the Amateur Radio Service.

C. NARA believes that the Novice and Technician classes are important and respected entry level licenses into the Amateur Radio fraternity. We are committed to increasing their benefits and stature in the Amateur Radio community.

D. NARA is committed to representing the interests of all Novice and Technician Class Amateurs at the national level.

E. Finally, NARA is very concerned that confiscation of frequencies assigned to the Amateur Radio Service will continue. NARA is committed to obtaining new spectrum for the continued growth in numbers of Novice and Technician Class Amateurs.

Membership and Subscriptions

Those joining NARA receive a subscription to *The Amateur Radio Communicator* for one year. The combined cost of membership and magazine is $10.00 per year in all areas with a U.S. zip code. The NARA membership and subscription to *The Amateur Radio Communicator* cannot be separated.

It is not necessary to hold an Amateur Radio license to become a member of the National Amateur Radio Association. The only "qualification" is an interest in radio communications.

How To Contact NARA

National Amateur Radio Association
P.O. Box 201407
Arlington, TX 76006
Inquiries............................(817)860-0978
Orders Only..............1(800)GOT-2HAM
1(800)468-2426
FAX..................................(817)860-0979
MCI Mailbox.............................365-8035
CompuServe............................70371,111
Advertising.......................(817)860-0978

Editor/Publisher........Donald L. Stoner, W6TNS
General Manager.............Joe Condron, AA5LD
Marketing............................George Ure, AC7X
Technical Editor.............Terry Dettmann, WX7S
VHF Editor.....................Gordon West, WB6NOA
Technical Advisor..............Dan Lewis, N7NQL
Programming...................Olan Hanley, KB7GIS
Publication................Deb Davis Bundy, N7IHY
Finance.......................................Lucy Heenan
Advertising......................Joe Condron, AA5LD

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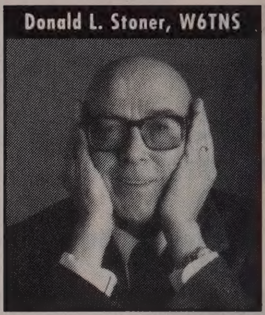
Donald L. Stoner, W6TNS

10 Meters Is Dead—Baloney!

by Don Stoner, W6TNS

MOST OF you who have followed my trials and tribulations with the condominium association where I live, know that I am involved in a "knock-down, drag-out" lawsuit. It's a long story, and I won't bore you with the details, but for three years the 440 West, Inc. condominium association has prevented me from putting up an Amateur Radio antenna. I consider restrictive antenna covenants to be an illegal restriction on my ham activities. Among other things in my suit, I am charging unreasonable restriction on my freedom of speech and a violation of my civil rights. The antenna restriction prevents me from maintaining the many friendships I have made all over the world in my 40 years as an Amateur Radio operator.

Recently, on the advice of my attorney, I put up a long-wire antenna. After three years, it is great to be back on the air again. It is also fantastic to have an antenna up 200 feet in the air. The long wire, fed with an SGC "Smart Tuner" really warms up the airways.

Look for W6TNS on 10 meters. This band has always been my first love. It was on 10 meters that I worked my first DX (long distance) station, prompting the DX bug to bite me. Satellites be damned, overseas phone calls-phooey. Even after 40 years as a ham, there is no thrill like hearing a station in Upper Slobovia come back to your CQ call.

If you went a bit beyond memorizing the Novice test, you know that the 10 meter band is affected by the sun. Ol' Sol gets acne every 11 years and spots on the surface become numerous. This causes our ionosphere to support long distance communications on higher and higher frequency bands.

> Look for W6TNS on 10 meters. This band has always been my first love. It was on 10 meters that I worked my first DX station, prompting the DX bug to bite me.

Conventional wisdom has it that during periods of low sun spots (like right now), the 10-meter band is dead. And, while it is true that ionization is at a low ebb right now, the band is far from dead. Every day since I put up the antenna, without exception, 10 meters has been open not only for stateside stations, but for overseas stations (usually Latin America). There are a number of mechanisms that permit "skip" besides high sunspot activity. For example, sporadic "E" creates "hot spots" in the ionosphere. Any stations within range of this spot can communicate via ionospheric transmission.

One of the many by-products of Novice Enhancement (permitting Novice and Tech-Plus operation on 10 meters) is the high level of activity it has promoted. Even when there is activity between 28.3 and 28.5 MHz (the Novice/Tech portion of the band), one seldom hears stations outside this range (General Class and higher can operate from 28.3 to 29.7 MHz). That's a hoot, isn't it? The "higher class" hams are coming down to the Novice/Tech band so they can have a contact!

So give 10 meters a try and work the world. If you have a Tech license, you only need to learn to receive Morse code at a five word-per-minute rate. It is a "piece of cake!" Remember, at one time you thought the Tech test was tough also (until you took it and passed).

You can get active on 10 meters very inexpensively. Since most people think 10 is dead, you can pick up a 10-meter only radio "dirt cheap." I saw one at the Miami Hamboree for only $100, complete with a 12-volt power supply. If you are serious about advancing your license class beyond Novice/Tech

Plus, give some thought to purchasing an all-band high frequency rig. The Kenwood TS-50 is a real bargain. Check at your local ham radio store for their used equipment specials. Hams want rigs with the latest bells and whistles. It is not at all unusual to find a "cherry" rig that has just been traded in, after a year or so, on one of the new transceivers with digital signal processing. The ham dealer will make you a tempting offer to sell his used radios. He knows you will be back in a year or two for a bells and whistle radio, just like all the other hams!

Think an antenna is expensive? Poo! Take a piece of lamp cord (you know, the brown cord used to wire up lamps), separate the wires for eight feet, and presto! You have just made a dipole. Stretch the eight-foot wires out horizontally between two trees (or other support) and use the rest of the cord for the transmission line by installing an SO-239 connector on the end. Figuring three bucks for the connector, another buck or so for the end insulators and wire, you can erect this 10-meter dipole for less than $5.00!

Don't be surprised to hear Joe in Asuncion, Paraguay (ZP5JLC), Ralph, 450 miles south of Santiago, Chile (CE6EZ), Marcos in Portugal (CT1EHI), Victor in Panama (HP6AYV), or P40V on Aruba come back to your CQ call. I worked all these stations in the past few days on 10 meters, plus numerous stateside hams.

THREE CHEERS FOR MCCAW AND GATES!

As this is being written, Craig McCaw and Bill Gates have just announced their plan to form Teledesic Corp. to orbit a $9 billion satellite network. The headlines in the *Wall Street Journal* read "McCaw-Gates Satellite Plan Draws Skeptical Reviews." Well, I've got news for you WSJ. When two of the richest men and CEO's of the largest companies in their field say they are going to do something, you can make book on it. Criticizing their idea is a bit like suggesting that Ross Perot can't compete with the established political organizations.

Hailing from Seattle, I can tell you that both companies employ a lot of hams and I'll bet many will be involved in this network. And the pioneering work in low earth orbit satellites done by Amateurs will provide a foundation for this network. I think it's the best idea since sliced bread.

Quoting from the Wall Street Journal, "God save us, it's the stupidest damn thing I've ever heard of," said John Pike, director of the Federation of American Scientists' Space Policy. His comment

(Continued on page 5)

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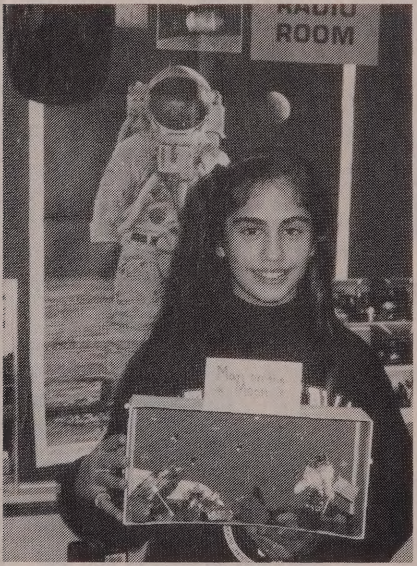
The Lunar Loan Program

by Carole Perry, WB2MGP

Carole Perry, WB2MGP

LUCKY IS THE teacher of Amateur Radio in the classroom! There's probably no other curriculum that lends itself to such a myriad of subject areas to pursue. Working with the SAREX (Shuttle Amateur Radio Experiment) program has lead to all kinds of interesting paths to explore with the children. I recently attended a NASA teacher's workshop, and left with a suitcase filled with notes of great ideas for the classroom.

Once you get the kids involved with speaking with astronauts, building projects, watching some of the terrific NASA videos, or listening to shuttle retransmissions, you won't be able to hold back the flood of excitement that the children will get caught up with. Every term I include a unit on Space Travel and Communications. I'm always pleasantly surprised to see how creatively each group pursues its own interests in this fantastic area of study.



Lisa, a sixth-grader, displays one of her follow-up projects in the "Space Travel and "Communications" unit.

The Lunar Loan Program is a wonderful program for educators that is worth getting involved with. I interviewed Richard Crone from the Educational Programs Office at the Goddard Space Center for details about the program. He stressed that Goddard handles the Lunar Loan program a little bit differently from the other NASA field centers. He suggests that any teacher who does not live in the Northeastern part of the country which is serviced by Goddard should contact their local NASA Teacher Resource Center for applicable information.

These space-age pioneers brought back 381 kg of lunar material. Luckily for educators, a small portion of this "extraterrestrial" material is available for classroom use.

Richard explained that each center has a different method of certification. I'll explain how to get certified by the Goddard Space Flight Center for this program. On July 20, 1969, Neil Armstrong became the first of only 12 astronauts to explore the surface of the moon. These space-age pioneers brought back 382 kg of lunar material. Luckily for educators, a small portion of this "extraterrestrial" material is available for classroom use.

In 1985, the Education Office at the Goddard Space Flight Center accepted responsibility for lending samples to educators in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the District of Columbia. The lunar sample disc is 15 cm in diameter and consists of six samples representative of the moon's geology. Goddard officials recommend that the disc be studied using a binocular microscope. The samples are examples of basalt, breccia, highland soil, anorthosite, mare soil, and orange soil.

The Educational Programs Office has direct responsibility for 19 lunar discs. The discs are mailed to "certified" educators on a first-come, first-served basis. A teacher can become certified by attending a full day program in November at the GSFC. Educators participating in this conference will be briefed about the security requirements for the disc, current NASA educational programs, and Goddard's Teacher Resource Laboratory. In addition to the briefing sessions, each educator will participate in a group tutorial session with a Goddard scientist.

Educators who have been certified to borrow lunar material must submit a written request at least one month before the first date of the requested loan period. The normal loan period is between 1 and two weeks. We can easily appreciate that the lunar material in the discs is irreplaceable. Although the samples have no "cash value" they do represent a national treasure. Security must be a prime concern for anyone involved in the loan program. Exact specifications of how the samples must be stored will be provided to the participant.

The lunar disc is part of an educational package that contains 25 copies of the publication "What's New on the Moon", a 16mm film and VHS video tape copy of the film "Reading the Moon's Secrets", a filmstrip and audiotape, and a teacher notebook containing actual photographs of the assigned sample along with several student activities.

Richard Crone invites you to contact him for additional information. He can be reached at Code 130.3, Educational Programs Office, Goddard Space Flight Center, Greenbelt, Maryland 20771 or (301) 286-7205.

Seventh-grader, Mohammed, building a launch site.

73 from Carol, WB2MGP ❑

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In My Opinion

(Continued from page 3)

illustrates why there are few scientists heading large software, cellular or other innovative companies. Scientists are not too strong on the visionary thing, as Mr. Pike's comment illustrates. You can also bet that the Federation American Scientists' has a competing idea.

Again quoting WSJ, "Just launching that many birds will be an awesome undertaking," noted a spokeswoman at TRW. "Assuming the launch of 840 satellites is successful, there's an awful lot of ground control." Hummm. Sounds like a great task for the shuttle! Put Endeavor into a polar orbit and pitch out a bird every couple of minutes. As anyone who has heard one of the Microsats knows, a communications satellite does not have to be very large.

73, De Don, W6TNS ❑

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Are You A "Horn Honker?"

by Hans Brakob, K0HB

AFTER HEARING A number of discussions on a number of subjects (all of which seem to follow the thread of "someone oughta do something about that") I am reminded of a story.

The story is told of a lady motorist who was stalled at an intersection, unable to restart her car. The light changed from green to red, back to green, and again to red, while she tried everything she knew to get her vehicle to move. In back of her an impatient motorist began honking his horn, fussing, and generally demanding that she "oughta do something".

Finally the lady walked back to the loudmouth and calmly said, "If you will get my car started, I'll be glad to keep honking your horn and yelling for you!"

It strikes me that there is a growing surplus of "horn honkers" and a lot fewer who would get out and help get the car started.

It doesn't take a lot of intelligence or talent to sit back and find fault or criticize. The key to getting something done is — ACTION! That's the word that separates the "carfixers" from the "horn honkers". The person of action is the one who does something about a problem, instead of sit and complain and condemn.

I am amused by those few who "honk their horn" at the ARRL, acting as though a handful of folks in Newington has the job to "save Amateur Radio". You got it all wrong guys! The ARRL is 170,000 folks OUT HERE who "oughta be doing something". The "hired hands" (elected folks and the Newington crew) would like nothing better than for you to help us "do something".

If you don't like what you hear on the air, help us gather the evidence to help the FCC. Better yet, spend some time teaching a newcomer the "right way", so we can all have more fun!

Quit honking your horn and help us fix the car! Join the Amateur Auxiliary, "Elmer" a newcomer, present some well reasoned ideas to your Division Director, (if he doesn't listen, run for Director yourself!), help your local club organize training classes in good amateur practice, or whatever else your time and talents allow. Trust me, you'll find so much to do, that you'll have no time left to condemn and criticize those who are beside you trying to keep the car running.

The German philosopher Goethe said: "What you can do or dream you can do, BEGIN IT; Boldness has genius, power, and magic in it."

Or continue to honk your horn and yell—in the end you can always bemoan "somebody shoulda done something, and I surely always told them so!"

Excuse me, I gotta go start another car.

73, de Hans, K0HB ❑

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Ham Astronaut Goes To Russia

Astronaut Ken Cameron, KB5AWP, has been named Director of Operations-Russia and manager of NASA operational activities at Star City and at the Russian control center at Kaliningrad.

He will work with Russian Space Agency engineers and flight controllers on the US-Russia cooperative space program, including supervising NASA astronaut training at Star City and developing plans and procedures to support joint space shuttle-Russian Mir space station flights and space station development. He is expected to command one of the early shuttle docking missions with Mir.

Cameron, 44, has flown on two SAREX shuttle flights, STS-37 in 1991 and STS-56 in 1993. Both these shuttles were "all-ham flights."

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NEW!

SB-7/SB-7NMO Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
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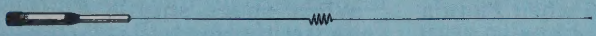

NEW!

SB-5/SB-5NMO Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 3.0dBi ½ wave 446MHz 5.5dBi ⅝ wave x 2	1.5:1 or less	120W FM	38"	PL-259 or NMO style

NEW!

SB-2/SB-2NMO Dual-Band 146/446MHz

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 2.15dBi ¼ wave 446MHz 3.8dBi ⅝ wave	1.5:1 or less	60W FM	18"	PL-259 or NMO style

B-10/B-10NMO Dual-Band 146/446MHz, Cellular Look-a-like

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 0dBi ¼ wave 446MHz 2.15dBi ½ wave	1.5:1 or less	50W FM	12"	PL-259 or NMO style

B-20/B-20NMO Dual-Band 146/446MHz, Cellular Appearance, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 2.15dBi ½ wave 446MHz 5.0dBi ⅝ wave x2	1.5:1 or less	50 watts	30"	PL-259 or NMO style

NEW!

SB-25/SB-25NMO Mono-Band 146MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
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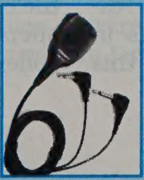

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TRI-BAND MOBILE ANTENNAS

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Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
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FJ-15S Tri-Band 52/146/446MHz w/Fold-Over

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
52MHz 2.15dBi ¼ wave 146MHz 4.5dBi ⅝ wave 446MHz 7.2dBi ⅝ wave x 3	1.5:1 or less	120 W FM	4' 10"	PL-259

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¼ wave	2:1 or less	1 lb. 14 oz.	4' 4"	120W SSB (200W SSB 28MHz)	PL-259

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NEW!

CH-722SA High Gain HT Antenna
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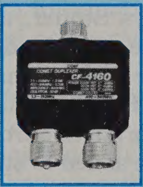
446MHz 5.5dBi ⅝ wave x 2
Max Power: 50 watts
Length: 35", 2 sections, 18" each
Connector: BNC

CH-32 Miracle Baby 146/446MHz HT Antenna
Gain & Wave: 0dB ¼ wave
Max Power: 10 watts
Length: 1.75"
Connector: BNC

DUPLEXERS AND MOBILE MOUNTS



CF-4106K, I, J,
146/446MHz
Band Pass, Ins Loss, Max Pwr.
1.3-150MHz, 0.1dB, 800w PEP
400-540MHz, 0.2dB, 500w PEP
Isolation: 60dB

CONNECTORS:

	4160K	4160I	4160J
Output:	SO-239	SO-239	SO-239
Low In:	PL-259	PL-259	SO-239
High In:	PL-259	N-Male	SO-239

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Multi-Adjustable Window Clip Mount.
11.5 feet of high quality coax.
Gold-plated UHF Conns. for Antennas up to 40" in height.

NEW!

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13.5 feet of low loss coax. Gold plated UHF (PL-259/SO-239) connectors.

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Same as 3D4M, but 17 feet of coax

CK-5M Deluxe Cable Assembly
13 feet double shielded very low loss coax + 12" RG-188 teflon coax. Gold plated UHF (PL-259/SO-239) connectors.

CK-5M5 Deluxe Cable Assembly
Same as CK-5M, but 17 feet of coax

The Washington Newsline

by Bill Pasternak, WA6ITF

FLORIDA LEGISLATION SOUGHT TO END DEED RESTRICTIONS

"Deed restrictions and other Covenants work against the safety of the entire community and should be revised." So says National Amateur Radio Association President Donald Stoner, W6TNS in announcing a two prong attack against these property use constraints.

First off, Stoner has filed suit against his homeowner's association know as 440 West Inc of Clearwater Florida. He maintains that the homeowner's association has banned his erecting any form of ham radio communications antenna, while at the same time violating the prohibition by having installed a community television antenna and a two-way radio system for security use. W6TNS says that the ban on his installation of an antenna has violated his civil rights and impaired his freedom of speech.

But Stoner believes that any solution for him will be short term and that it may not assist other Florida radio Amateurs finding themselves in a similar situation. Nor will it help to set a national precedent to help hams in other states.

Stoner says that this has to change, even if change is made a matter of law. To that end, W6TNS has proposed legislation that will require that each condominium, planned community, and mobile home park in Florida have an emergency preparedness plan which includes ham radio. Furthermore, if an Amateur lives in one of these planned communities, he or she would be allowed by law to install an antenna system suitable for providing safety communications to the community.

W6TNS points out that it was not all that long ago when Florida residents had a painful, first-hand example of a communications emergency when hurricane Andrew devastated south Florida. He says that communications provided by radio Amateurs was vital to the life saving effort during the storm and to relief efforts afterward. Yet he notes that many communities and property owners who owe their very survival to the volunteer efforts of radio Amateurs have not only turned their backs on these communications heros, but some have gone so far as to show their collective displeasure with the very existence of the Amateur Radio service. This has to stop, says Stoner, and he intends to be one of the leaders in bringing about the needed change.

Radio Amateurs throughout Florida and from around the nation are asked to support the Stoner legislation. For additional information, contact Richard Heiden, Esq. at Kimpton, Burke and White, Attorneys At Law, 28059 U.S. Highway 19 North, Clearwater, Florida 34621. Heiden is the attorney of record in Stoner's suit against the homeowner's association and directs Stoner's legislative efforts in the State of Florida. If enacted, this law could become the model for hams to use in other states and possibly lead to preemption of Conditions, Covenants and Restrictions nationwide.

YOUNG HAM WINS CONTEST TO SEE SHUTTLE LAUNCH

When space shuttle Endeavor lifted off, an 8th grade youngster from Staten Island, New York, was at Cape Canaveral to watch. Rene Hoehn, KB2QMR, has been chosen by the faculty of the Rocco Laurie Intermediate School to be there after winning an essay contest. Her teacher, Carole Perry, WB2MGP, says that she decided to limit the contest to only her ham radio students:

Rene Hoehn was selected by a committee of judges that included the Principal and Assistant Principal of the Rocco Laurie School, as well as Carole Perry. The trip to the STS-59 launch was not the first special school event that KB2QMR has attended. WB2MGP says that Rene is a student who gets involved.

By the way, STS-59 is a Shuttle Amateur Radio Experiment flight. Among its crew members is Astronaut Jay Apt, N5QWL.

INSTRUCTOR AWARD NOMINATIONS

If you know of a deserving volunteer instructor, professional teacher who uses Amateur Radio in the classroom, or an instructor who offers ham radio classes at a local college, you can nominate them for any of the following awards from the American Radio Relay League.

The ARRL Herb S. Brier Instructor of the Year award honors volunteer instructors. The ARRL Professional Educator of the Year will be awarded to a deserving school teacher, while the ARRL Professional Instructor of the Year will be presented to an instructor who receives payment for his services, such as at a college. Nominations must be received by your ARRL Section Manager. Their names and addresses can be found in any issue of *QST* magazine.

FAR SCHOLARSHIPS

Keeping with the subject of education, word is that the Foundation for Amateur Radio will be offering 49 scholarships for the 1994-1995 academic year to assist in the education of licensed radio Amateurs. Licensed Amateur operators can compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college or technical school. The awards range from $200 to $500, with preference in some cases given to residents of specific geographic areas or the pursuit of certain study programs. For additional information or application forms please contact the Foundation for Amateur Radio, F-A-R Scholarships, 6903 Rhode Island Avenue, College Park, Maryland 20740.

MOTOROLA

Motorola says that an advertisement appearing in several magazines that starts out—attention—this is a public safety announcement—is actually aimed at cellular telephone hackers. These are thieves who have found ways of diverting the billing of cellular phone calls to unsuspecting legal users of the service. There are even books on sale that tell anyone with a small amount of technical knowledge how to do it, but one publication says that it won't carry ads for them. The ARRL says it will not permit the advertising of these or other cheat books in its *QST* magazine.

STROKE CW

When a ham in Fargo, Nortn Dakota suffered a stroke, he lost almost all ability to communicate. His voice was gone and he was immobilized. But he could tap out Morse code with his finger and that gave him hope. It became the job of Paul Winnell, WQ0J, to make known the thoughts and needs of Kurt Hall, W0AZV. Newsline joins with the ham radio community of Fargo, North Dakota, in wishing W0AZV a full and speedy recovery.

UK SCANNER STING

For the second time in less than a year, authorities in the United Kingdom have again turned the tables on scanner enthusiasts who eavesdrop on emergency service radio channels by issuing a false distress call and then arresting those who showed up on the scene.

As 1993 drew to a close, South Yorkshire police launched the undercover sting after finding evidence that criminals were cashing in on information that they intercepted over the airwaves. As they did last spring, police dispatchers broadcast a phony report that aliens were invading earth and had been spotted in a nearby town. Yes, aliens, as in little green men from Mars.

Anyhow, reports are that several people showed up at the address given in the bulletin. They were arrested at the scene and charged with acting illegally on information broadcast in an official police radio channel.

Under British law it is not illegal for scanner buffs to eavesdrop on emergency communications. It is against the law to take any action based on any information that might be heard.

A similar sting last year in central London netted more than a dozen scanner addicts who showed up at the site of another supposedly downed alien spaceship. All were forced to pay heavy fines and a few of them actually did jailtime.

LIFETIME HAM LICENSE PETITION

The ARRL has petitioned the FCC to make Amateur Radio operator licenses valid for life. The League says in its petition that there is nothing in the Communications Act of 1934 that would prevent such a license term for radio Amateurs. It wants a lifetime operator's license to allow inactive Amateurs to return to the Service at the same class of license without the necessity of retesting.

This proposal will apply only to operator licenses: Amateur Radio station licenses would still, by law, be limited to a 10-year term. A person with a lifetime operator license, but no station license, would not be permitted to operate a station of his own, but would be able to operate from the station of another Amateur. The League says that nothing in this proposal should have any effect on the FCC's call sign issuance program, either as it currently exists, or as proposed in the vanity call sign program.

The ARRL says that it is not proposing at this time to make the rule change retroactive. Rather it suggests the easiest way to implement it is simply to extend currently held operator licenses from 10 years to life. No rule making number has yet been assigned to this ARRL regulatory change request.

ANTENNA BATTLE SUCCESS

A federal appeals court has found in favor of a Minnesota ham in the latest round of her three-year battle to install a tower and antenna.

Back in January of 1991, Sylvia Pentel, N0MRW, applied to the city of Mendota Heights for a zoning variance for a 68-foot crank-up tower. At the time she was using a roof-mounted vertical which, she was unaware, violated the city's zoning rules. The city denied her application for a tower, but did grant Pentel a special-use permit to allow her to keep the vertical.

But that did not satisfy N0MRW. Pentel sued the city in U.S. district court. Her attorney, John B. Bellows Jr., K0QBE, argued that the ordinance restricting her tower and antenna was preempted by a federal law. The law, known as PRB-1, recognizes the needs of both municipalities and Amateur radio operators and requires a reasonable accommodation of the needs of amateur radio operators.

When the district court decided in favor of the city, Pentel appealed: it was the United States Court of Appeals for the 8th Circuit that ruled that in establishing PRB-1, the FCC was attempting to strike a balance between the interests of municipalities and ham radio operators. The court noted that granting a special-use permit for Pentel's vertical was not an acceptable accommodation to the radio Amateur under the terms of PRB-1 and ordered the city to try again.

The court did put some limit on its decision. It said that its finding does not mean that the city must necessarily grant Pentel's application for a tower as it stands. Rather, it stated that Mendota Heights, Minnesota, must make a reasonable accommodation to insure that her interests as an amateur radio operator are protected.

INFORMATION SUPER HIGHWAY

Ham radio definitely will play an important part in President Clinton's information super highway. So says FCC Private Radio Bureau Chief Ralph Haller, N4RH. Speaking on Saturday, February 5th at the 1995 Tropical Hamboree in Miami, Haller told the group that it's the inventive nature of radio Amateurs that makes them so important to the emerging information flow.

Haller also took note of the success of the expansion of public service activities as a result of the FCC action to change its rules governing business communications. N4RH singled out the recent New York City Marathon as a primary example of the ham radio success brought about by this regulatory change.

N4RH says the rule change has expanded the public service abilities of the ham radio community.

TWO METERS SAVES A LIFE

Amateur radio may have saved a life when Diana Carlson, KC1SP, used a local repeater to report a possible suicide attempt to police. Carlson, of Hudson, New Hampshire, was on her way to work in Concord, Massachusetts, the morning of January 10, when she and another motorist observed a man climbing the railing of the Merrimack Bridge. The man's auto was parked directly in front of Carlson.

While the other motorist talked to the man, Carlson first tried a call on 146.52, which she knew was sometimes monitored by the Westford police. When no response came, she switched to the 147.12 repeater in Billerica. Larry Garneau, N1QEZ, who was mobile, responded and passed the message to his wife, Virginia, N1QFA, who telephoned police. An officer of the Tyngsboro Police arrived in time to pull the 27-year-old from the bridge railing.

Diana Carlson comes from an all-ham family. Her husband David is N1JYX, her son is KA1VWX and her daughter is KA1VUA.

200 MHZ TO BE RE-ALLOCATED—HAM RADIO AFFECTED!

Amateur Radio may lose part or all of one super high frequency band in the wake of the release of a Commerce Department report that recommends moving the military and other government agencies off much of the nation's airwaves to make way for new commercial use of the spectrum. The spectrum under fire is at 2390 to 2400 MHz and 2402 to 2417 MHz. If the FCC chooses to reassign it to the commercial sector, its loss will impact several important ham radio projects including high-speed packet radio data relays.

COURT ORDERS HAM OFF REPEATER

This just in. An Orange County, California, Superior Court has issued a three year restraining order against a ham that will keep him from operating on an area repeater. The order was requested in January by an attorney for the Clairmont Amateur Repeater Association and was issued against Tim Seawolf, KJ5KE, of Quail Valley. This is a precedent-setting case in that the club has used the civil rather than federal court system to ban someone from its repeater that they allege to be an undesirable operator. More details in the next issue.

GEORGIA ANTI CCR BILL

A bill introduced in the Georgia Legislature that would eliminate the effect of restrictive property covenants on Amateurs is believed to be the first of its type in the nation, according to Georgia ARRL Section Manager Jim Altman, N4UCK.

Altman says that the proposed legislation, known as Georgia House Bill 1134, would prevent all new and renewed covenants from regulating, controlling, or restricting antennas owned and operated by licensed Amateurs in the state.

Altman says that in Georgia, all restrictive covenants have a life of 20 years, but can be renewed. In banning new and renewed covenants the proposed new law would leave the existing covenants in place until their natural expiration, and prevent new ones. Then, over the next 20 years, all existing covenants would disappear.

The bill was initially referred to the State Bar committee on real property law, which gave the measure a "do-pass" recommendation. That's a good sign and Amateurs in Georgia are urged to contact their state legislators and urge their support of H.B. 1134. Hams elsewhere will want to watch this case carefully, as it could set a national precedent for fighting deed restrictions nationwide.

SEATTLE TROLLY QRM

Seattle, Washington, hams are once again suffering from trolley car induced RFI. The story goes back aa number of years when Seattle added a number of new electric trolleys to its fleet. According to Clay Freinwald, K7CR, of the

Western Washington Amateur Relay Association, the presence of these new trolleys was instantly noted as their new electronic control system radiated like an all-band transceiver and the overhead cattinary system of power wires became their gigantic antenna.

Marty Hadfield, a broadcast engineer at KMTT, jumped into the matter. Operating through the Western Washington Cooperative Interference Committee, Marty was able to get the Metropolitan Transit System to install filters on the vehicles to help minimize the problem. The filters were not a cure-all, and you can still hear some of the interference on any AM radio.

Recently the transit authority purchased some dual-powered vehicles. They run on diesel engines in outlying areas and then connect to the transit overhead wiring when inside Seattle proper. And Marty Hadfield says that the new vehicles are not much different than the old ones. They too radiate like crazy, and this time the interference is not limited to the AM broadcast band. He says that almost any radio in the downtown area can hear what sounds like a cat's meow on any two-way radio, including those used by hams. Marty is trying to solve the problem, but it looks as if it's going to be an uphill road till all of the meowing is gone from the Seattle radio airwaves.

FIRE COMMISSIONER PRAISES HAMS IN EARTHQUAKE COMMUNICATIONS

Ham radio has been praised by the City of Los Angeles for jumping in when hospital communications failed after the January 14th Northridge earthquake. According to Fire Department Chief Alan Cowan, the hams were called on to take the place of the regular hospital dispatch services when the hospital-to-fire department interconnect failed following the quake.

According to Chief Cowan, communications breakdowns following the quake left ambulance drivers confused about where to take the injured. Speaking at a recent Seismic Safety Conference in Burbank, California, Cowan noted that the breakdown was so severe that fire captains had to be dispatched to area hospitals to assess their status and determine where ambulance drivers could take victims. Cowan said the fire department finally reestablished communications when ham radio stations were set up at each hospital. But he added that the felt the existing hospital radio dispatch systems were inadequate for communications between field paramedics and base hospitals. A hospital association spokesman acknowledged that 12 hospitals declared internal disasters requiring paramedic ambulances to pass them by. The spokesman declined comment on the charges of inadequate communications following the 6.8 tremor. But Seismic Safety Commission members said they were gravely concerned by the performance of hospitals in the hard-hit San Fernando Valley. They say that they were glad that radio Amateurs were available to step in when needed.

LATEST NUMBERS

And the FCC has tallied some numbers on the VE system since its 1984 debut, and from its perspective, things are looking real good. According to the commission, through late 1993 the total number of VE testing sessions held was 56,485. The number of people attending these test sessions was 640,453 and volunteer examiners administered 1,052,269 test elements to these applicants. There were no numbers given for the amount of exam cheting takeing place, but it's believed very small in comparison to the overall success of the all-volunteer testing system. The latest testing scandal involving at least 30 California volunteer examiners is still under investigation by federal authorities.

DAYTON WINNERS

This year's Radio Amateur of The Year award recognizes a man known for pushing—pushing for the rights of Amateur Radio operators: Perry Williams, W1UED, the long-time Washington liaison for the American Radio Relay League.

Williams has represented Amateur Radio on Capitol Hill since 1980. In his 14 years as Washington liaison, Williams has fought many battles on behalf of the Amateur service.

The Wards Committee named Russ Kroeker, N7HGE, of Kent, Washington, winner of its Special Achievement Award. Kroeker helped design the Evergreen Intertie, a repeater system linking the northwest U.S. with Canada. The Committee's Technical Achievement Award went to Dick Newell, AK1A, of Bolton, Massachusetts. Newell was recognized for his work in designing packet radio clusters, which are popular in contesting and DXing.

73 de Bill Pasternak, WA6ITF ☐

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So You Think KDKA Was First?

by Lou Schneider, N6YMQ

MOST PEOPLE believe that the first commercial AM station was KDKA in Pittsburgh, when Frank Conrad, 8XK, started playing records on the air for his friends and neighbors back around 1920. KDKA may have been the first station to receive a commercial broadcast license, but there was a thriving commercial station in existence ten or more years before the government began regulating radio.

This station was in San Jose, California, and began broadcasting in 1909 using a crude spark transmitter. When formal call letters were assigned it became 6XE, later KQW. Today it is KCBS San Francisco.

Dr. Charles Herrold ran a radiotelegraph school in San Jose, California. In 1909 he began a regular schedule of voice and phonograph music to call attention to his school. Reception of his broadcasts in those pre-vacuum tube days was via the crystal sets used to receive spark gap Morse code.

By 1911, Dr. Herrold had developed a quenched spark generator consisting of a copper tube surrounding a precision machined carbon rod. These were immersed in alcohol and the entire device was water cooled. Modulation was via a multiple element water cooled carbon microphone in series with the high voltage supply.

Because of the alcohol bath and precision tolerances the arc carrier wave produced by this transmitter was considered to be exceptionally pure. One person described the signal as being inaudible unless modulation was applied.

> KDKA may have been the first station to receive a commercial broadcast license, but there was a thriving commercial station in existence ten or more years before the government began regulating radio.

Voltage for the transmitter was at first stolen via a hooked stick from a 600 volt DC trolley line running outside a second floor window. Later the trolley company installed permanent service to the station along with an electric meter. At one point Herrold said his transmitter consumed 9 Kw from the electric supply.

Dr. Herrold kept up a regular schedule of music and news for over a decade. Besides broadcasting to the ham radio operators, he established a public listening hall several miles away in downtown San Jose. Since the loudspeaker had not yet been invented, people listened to his broadcasts on telephone handsets located throughout the hall.

Dr. Herrold's operation had all the trappings that distinguish a commercial broadcasting station. A local phonograph store supplied popular records for him to play on the air in return for mentioning the source of the records. Local musicians sang and played songs over the air. Dr. Herrold read news from the local paper. He sold cash advertising to department stores and food markets. He documented the size and location of his audience by inviting listeners to write in for a gift certificate that could be redeemed at a merchant near the listener. Over 4,000 of these certificates were distributed. One of his sponsors, a candy company, promoted a specific type of candy on his programs. They claimed the sale of this item increased not only in San Jose but in communities all up and down the Pacific Coast.

These broadcasts developed enough of a reputation that when Dr. Lee deForest was unable to get his vacuum tube transmitter operating in time for the 1915 San Francisco Pan Pacific Exposition, he used Dr. Herrold's transmissions (almost 50 miles distant) to demonstrate his new vacuum tube receiving apparatus. Throughout the run of the fair, Dr. Herrold's station was on the air at least eight hours a day.

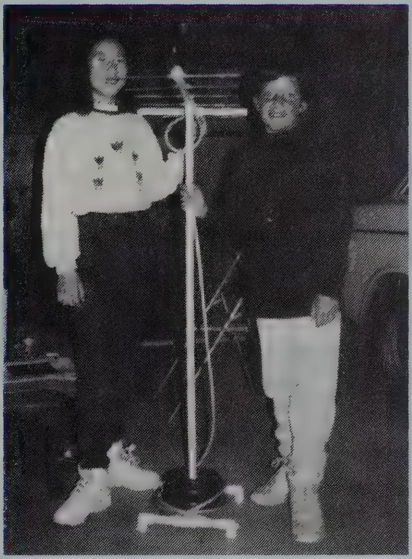
Unfortunately, Dr. Herrold's apparatus would not function above 600 meters, so when the FRC established the present AM broadcast band in the 1920s, Dr. Herrold gave the KQW license to others with sufficient capital to purchase new Western Electric equipment. At first it was used by the First Baptist Church of San Jose to broadcast its Sunday services. Later farm and agricultural news was added to the schedule. In the 1940s KQW was sold to the CBS radio network and in 1951 it became KCBS.

Authors Note: *This information comes from a collection of Dr. Herrold's papers that I found at work, compiled and published by a journalism professor in San Jose. The reference is: KCBS—BROADCASTING'S FIRST STATION*

Records and Documents Supporting the Claim by Charles D. Herrold that He Established the World's First Radio Station in San Jose, California, in 1909, which is now KCBS. Compiled by Gordon B. Greb, Professor of Journalism, California State University, San Jose, California There are no publication or copyright dates, but the foreword is dated June 13, 1973.

73 de Lou Schneider, N6YMQ ❑

THE FUTURE OF OUR HOBBY



Meet Thomas Coffee, 8, and Judy Kang, 10, posing with the six-element 432 MHz Yagi that they built as their fifth-grade science project. Both youngsters are aspiring ham operators: Thomas has passed his Novice exams and is waiting for his ticket to arrive, while Judy has passed the five wpm code exam. Both hope to hold Tech-Plus tickets before they graduate this June from Victor Elementary School in Torrance, California.

Thomas and Judy built their beam with PVC sprinkler pipe and six-gauge copper wire, fed with RG-8/U foam core coax. The radiator is a folded dipole made of hookup wire and supported by a noticed PVC pipe crossboom.

Thomas's dad, WA2OJL, provided the signal source, while the youngsters' 5th-grade teacher, K6JEY, provided a wattmeter and spectrum analyzer for measurements.

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Jerry Marsh, AA7UF

Digital Basics

by Jerry Marsh, AA7UF

> A more recent code which is widely used is ASCII (American Standard Code for Information Interchange). ASCII is a true seven level code.

IN MY LAST ARTICLE, I talked about the difference between an analog communication or signal and a digital signal. The distinguishing characteristic of a digital signal, is that it has only two states, which we think of as On or Off, High or Low, 1 or 0. The receiving equipment for such a signal only has to be able to distinguish between the two to interpret and understand the meaning contained in it. Sometimes we refer to this type of signal as **binary** ("bi" meaning two), because of the two possible states that the signal can have.

The topic we will cover this time is: How is information stored or encoded using a digital signal?

Actually, you should already be quite familiar with one binary code: Morse Code. In Morse Code there are also only two states: DIT (.) and DAH (-). When we listen to Morse Code, we distinguish the difference between the two by length of time, the one relative to the other. One of the differences between Morse Code and most other binary codes is that with Morse Code, the number of elements (DITs and DAHs) which make up a letter, number or other symbol vary. For example, with the letter "E" (.) there is only one element, for the number "9" (- - - - .), there are five elements.

One of the other early codes used in Amateur Radio is called **Baudot** or ITA2. It is called a five level code because every character in the code consists of five elements. The letter "A", for example, is represented as 00011, the letter "U" as 00111, and so on. Baudot was and still is used for digital communication via Amateur Radio Teletype (RTTY). However, there are several shortcomings in the Baudot code. First, if you count up all of the possible combinations of codes (00000, 00001, 00010, 00011, . . . 11110, 11111) you find out that there are only 32 possible combinations. With 26 letters, 10 numbers, plus other special symbols, this is not enough.

To solve this problem, some of the combinations are made to do double duty. The Baudot code 00111 which I showed above not only represents the letter "U", but also, the number "7". To make this work, there are two special codes: **LTRS** (11111) and **FIGS** (11011). These are much like SHIFT-LOCK and UNSHIFT on a typewriter. When a message starts out, you are assumed to be in LTRS mode. If the code 00111 is received, it is interpreted as a "U". However, if the FIGS character is received and then 00111, it is interpreted as a "7". This is similar to shifting and unshifting a typewriter to change from lower to upper case, except in this case is LTRS to FIGS and FIGS to LTRS.

This code works fairly well under normal conditions. In most cases, if one of the zeros in a character is received and interpreted by mistake as a one, or vice versa, then a character would be printed incorrectly, but the human brain, being what it is, can probably look at the message in context and correct the error. We do that all the time when copying Morse Code.

But what if the code that got misinterpreted as a FIGS was a LTRS code? Missing the "shift", all of the codes following until the next LTRS or FIGS would be interpreted incorrectly. To help improve on this, a new code called **AMTOR** was developed.

AMTOR, unlike Baudot, is a seven level code. Every character is represented by seven elements. However, there are still only 32 possible combinations used. This is because the AMTOR code is constructed in such a way that there are **always** three zeros and four ones in every character. The letter "A" is represented by 1000111, the letter "U" (and number 7) is represented by 1001110. (If you look carefully, you will see a similarity between the Baudot and AMTOR codes.) For every character which is received, a check is made to make sure that it contains exactly four ones and three zeros. If not, then it is known for sure that the character was received incorrectly. The use to which this knowledge is put by the receiving equipment depends on whether you are running in AMTOR mode A or AMTOR mode B. The important thing is that the AMTOR code contains redundant error elements which improve the reliability (accuracy) of the received information.

A more recent code which is widely used is **ASCII** (American Standard Code for Information Interchange). ASCII is a true seven level code. This means it provides for 128 possible code combinations. This is enough for both lower and upper case representations of the alphabet, plus the numbers and other symbols without having to double up as was done with Baudot and AMTOR. Usually an additional redundant error element called **PARITY** is used, bringing the total to an eight level code. We will later see how parity and other error correction techniques work.

The important concept to understand, however, is that when there is redundant information added to a code or message which is based on the information being sent (such as the 4/3 AMTOR code), then improvements in accuracy can be attained. You are probably carrying around examples of this in your billfold or purse and don't even know it. Most credit card numbers contain one or more "check digits" which are derived from the preceding digits in the account number. If one of the digits is read incorrectly or even transposed in position, the "check digit" validation will fail. The purpose of this check digit is to help assure that the correct account gets charged for the purchase.

Next time we'll look at what is involved in transmitting a digital signal over a conventional communications circuit or radio link.

73 de Jerry March, AA7UF ❑

Baudot	AMTOR	Letters	Figures
00011	1000111	A	-
11001	1110010	B	?
01110	0011101	C	:
01001	1010011	D	
00001	1010110	E	3
01101	0011011	F	
11010	0110101	G	
10100	1101001	H	
00110	1001101	I	8
01011	0010111	J	(bell)
01111	0011110	K	(
10010	1100101	L	)
11100	0111001	M	.
01100	1011001	N	,
11000	1110001	O	9
10110	0101101	P	0
10111	0101110	Q	1
01010	1010101	R	4
00101	1001011	S	‘
10000	1110100	T	5
00111	1001110	U	7
11110	0111100	V	=
10011	0100111	W	2
11101	0111010	X	/
10101	0101011	Y	6
10001	1100011	Z	+
01000	1111000	(cr)	
00010	1101100	(lf)	
11111	1011010	LTRS	LTRS
11011	0110110	FIGS	FIGS
00100	1011100	(space)	
00000	1101010	(blank)	

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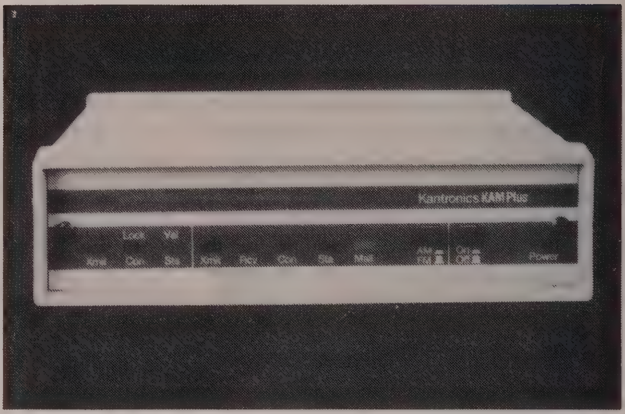
G-TOR Has Hams Buzzing

by NARA Staff

MOST newcomers have heard of RTTY or radio teletype. This was the first digital communications system adopted (and adapted) by Amateurs, if you don't count CW. The major fault with RTTY is there is no provision for error correction. What you got is what you get, so to speak. Unless the receiving station asks for a correction, errors remain in the received message.

AMTOR, which stands for AMateur Teleprinting Over Radio, provides error correction and has become very popular on the Amateur bands. The automatic repeat request (ARQ) mode is similar to the ACK/NAK information exchange that is used when we download programs from BBSs. Another mode provides forward error correction (FEC) by sending each transmission block twice.

Another popular mode is PACTOR, the acronym for Packet Teleprinting Over Radio. Basically, its German inventors looked at packet and AMTOR and tried to combine the best features of both. The result was PACTOR. While operation is similar to AMTOR, it is faster and more robust than AMTOR due to improved error correction, automatic speed selection and Huffman compression. Another advantage is that PACTOR is an eight-bit protocol, so that the entire ASCII character set can be used and direct binary file transfer is possible.



G-TOR can be installed in the Kantronics KAM Plus shown here, as well as the KAM Enhancement Board, by installing an upgrade EPROM.

Kantronics, of Lawrence, Kansas, has recently introduced a new mode that is catching on quickly, called G-TOR. This new HF mode is now standard in the KAM Plus and the KAM Enhancement Board. The acronym stands for Golay-TOR and was named for M.J.E. Golay. His error correction code was used by Voyager to transmit error-free color images from Jupiter and Saturn. This coding scheme provides the basis for G-TOR. G-TOR's fast, error-free data transmission capabilities can be attributed to the unique combination of several techniques including 1) full frame data interleaving, 2) on-demand Huffman compression, 3) run-length encoding, 4) variable baud rate capability, 5) 16-bit CRC error detection with Hybrid ARQ and 6) Golay forward error correction coding. Together in G-TOR, these techniques combine to provide fast, error-free data transmission in a mode that resists interference and reduces multi-path effects.

Field testing took place between Kantronics and InterFlex Systems by Karl, WK5M, Phil, W0XI and Jeff, WA4EGT. A baseline 9 kb file was sent on about 20 different occasions, beginning January 1, 1994. In more than 100 tests comparing G-TOR and Pactor, G-TOR outperformed Pactor at least two to one. In poor band conditions, which would normally hinder data transfer on most modes, G-TOR remained relatively unaffected and at times transmitted data nearly four times faster than Pactor. In Kantronic tests, during which they transferred more than one million bytes error free, the average character/second rate for G-TOR was 23.7 compared to an average of 8.64 characters/second for Pactor. Based on information cited in the article by Van Der Westhuizen, G-TOR appears to outperform Clover as well (see reference).

To protect data from noise bursts during transmission, G-TOR uses a concept known as interleaving, similar to the approach used in the audio compact disc. Through interleaving, the bits of each data character are dispersed across the frame and then rearranged upon reception. Therefore, if a burst error occurs on the HF channel, the damage will be spread out into small pieces across the entire frame rather than mutilating large, non-recoverable sections. Usually only one or two bits of a segment will be damaged, making the entire transmission easily recoverable.

At the same time, for fast and efficient transfer, data is condensed through Huffman compression and run-length encoding. Each method may translate data into codes shorter than required by the original information.

With Huffman, certain letters are assigned a code shorter than the original eight-bit ASCII character. At times, however, Huffman compression may produce more bits than the original message, so G-TOR is designed to use Huffman encoding "on demand," that is, only when the compression actually reduces the total number of bits. Run-length encoding functions similarly, but assigns a single code to those characters which have been repeated. Through these two compression methods, the average number of bits for a message is reduced, often as much as 30 or 40 percent.

During transmission, G-TOR automatically operates at one of three baud rates, 300, 200, or 100, whichever is optimal given the quality of the link. The G-TOR protocol adjusts the baud rate to ensure maximum throughput regardless of band conditions. Initially, data transfer occurs at 100 baud, but if transfer proceeds smoothly, the baud rate increases to 300. In the event of persistent interference or poor band conditions, G-TOR will automatically adjust to 200 or 100 baud. When band conditions improve or interference subsides, G-TOR again operates at 300 baud.

Once data is received and rearranged (de-interleaved), G-TOR uses 16-bit CRC error detection with a Hybrid ARQ scheme to detect and correct errors in transmission. The CRC code is calculated by the receiving station, and this code must match the CRC code that is transmitted with the original data. If the CRC codes do not match, indicating that errors have occurred, the hybrid ARQ system requests transmission of the correction bits. These are then combined with the damaged data bits in an attempt to recover the original data. The Golay error correction coding can correct three out of 12 transferred data bits, and damaged information is most often quickly and accurately restored without requiring re-transmission.

The G-TOR mode may be used in a variety of applications including MARS and portable operation, since the G-TOR protocol permits up to 10 characters for a callsign, allowing MARS calls or special identifiers.

If you would like more information on G-TOR, write to Kantronics, 1202 E. 23rd Street, Lawrence, Kansas 66046, or call (913) 842-7745 or FAX (913) 842-2021.

G-TOR is a trademark of Kantronics Co., Inc. Portions of this material supplied by Kantronics Co., Inc. Copyright 1994. Reprinted with permission. Reference: Van Der Westbuizen, Mike, ZS6UP, "A Practical Comparison Between Clover and Pactor Data Transfer Rates," CQ, February 1994:40-42

73s from NARA Staff ❑

Radio Club of America

(Continued from page 19)

You might wish to take a minute to think about your own situation. Do you have some valuable or historic electronic equipment, Amateur Radio or otherwise, and what's going to happen to it down the road? Will disposition of this equipment be just one more burden on your heirs, or can it become an asset to your estate? Would you like to make arrangements NOW for the eventual orderly disposition of this equipment?

If your answer to any of those questions is "Yes", you might like to consider making arrangements so that your equipment will eventually be given to the Legacy Fund of the Radio Club of America. The Radio Club's Legacy Fund was established several years ago with the objective of establishing an invested account whose income would be used exclusively to support payment of the day-by-day operating expenses of the Radio Club. This fund helps to provide long-term financial stability for the Club, and we hope that it will eventually allow all of the Club's income from dues and other sources to be spent for expanded philanthropic, educational and charitable programs.

We would ask that you consider assisting the growth of the Legacy Fund by considering these options:

An immediate tax deductible donation of cash, securities or salable electronic equipment to the Legacy Fund. Any equipment given to the Club will be disposed of by the Fund committee, and 100 percent of the sales receipts will be deposited in the Legacy Fund. By earmarking your equipment to be donated to the Legacy Fund you solve the eventual problem of its disposal, and provide a tax credit to your estate.

A bequest in your Will to the Radio Club of America of cash, securities or electronic equipment of historical or intrinsic value. The Legacy Fund Committee will arrange for the sale of equipment, or, if it isof historical value, for the presentation of it as a gift to an institution willing to put it on public display.

Donations to the Legacy Fund may be made in your name, or in the name of any other person, organization or corporation. Arrange NOW for eventual disposition of your electronic equipment. Historic or valuable equipment should be preserved rather than ending up as junk!

For further information, contact Arch Doty, Chairman, Radio Club of America Legacy Fund, 347 Jackson Road, Fletcher, NC 28732.

73 de Arch Doty, Jr., K8CFU ❑

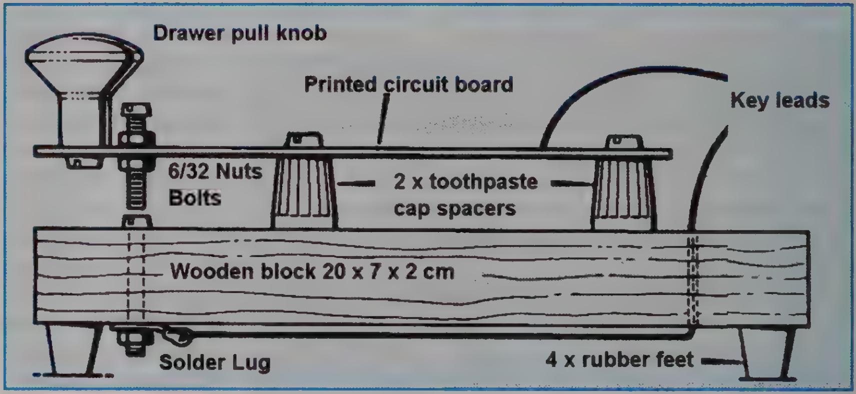
A Morse Key Made From A Printed Circuit Board

by D-I-Y Radio

The Morse code is used by many radio Amateurs because it is fun to use, it doesn't need an expensive or complicated transmitter, and often gets through when speech (or phone) transmissions fail. There are many ways to learn to receive Morse code. You can have a friend send to you, using a key and buzzer. The National Amateur Radio Association sells computer programs and cassette tape recordings. If you have a short wave receiver, you can hear Amateurs sending code all day and night on the 40-meter band (7.0-7.3 MHz).

The National Amateur Radio Association has been granted permission to reproduce material from "*D-I-Y Radio*," an excellent publication from the Radio Society of Great Britian. If you see their logo, shown below, it means the material first appeared in "*D-I-Y Radio*" and is reproduced with permission. For more information on the many excellent RSGB publications, write Radio Society of Great Britian, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE ENGLAND.

D-i-Y RADIO

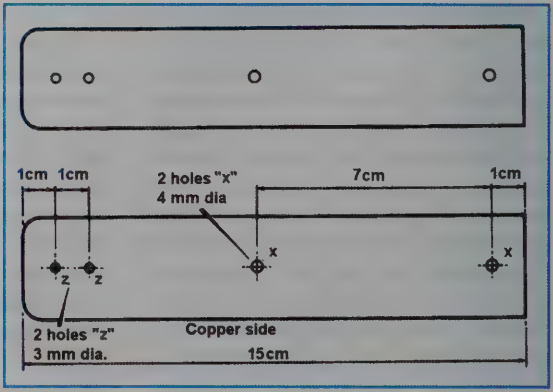


Learning to send Morse requires practice but, like learning a musical instrument, it is never forgotten. Some commonly used words can be shortened to save time; for instance TKS means "thanks," and 73 means "best wishes." This also makes it easy for Amateurs to communicate even if they do not speak the same language.

This construction project features a very clever idea of making a telegraph key out of a printed circuit board. It must be fiberglass board as this is what give the key the "spring." You can build the key without a soldering iron or solder lugs. Simply wrap the wire (with the insulation removed) under the screw heads.

The construction is almost self explanatory by looking at the accompanying drawings. You can scrounge printed board material from an electronics hobbyist friend. Usually you can find small pieces of PC board at the local radio store. The wooden base should be heavy (like Oak) so the key does not slide around. You may want to paint or varnish the wood before construction.

Drill holes in the PC board as shown in the accompanying drawings. Fix the knob to the front of the key. The knob could be made from all sorts of things, for instance a drawer handle. Drill the toothpaste cap "spacers" and screw the PC board to the wooden board. ❑



Leave Your Equipment To The Radio Club of America

by Arch Doty, Jr. K8CFU

I'D LIKE TO TAKE about a minute of your time to tell you about Harry Mills, a Fellow of the Radio Club of America. After spending his commercial lifetime with the Radio Corporation of America, Harry retired and has devoted most of the past two decades to his avocation, Amateur Radio. He is one of the most admired and respected radio Amateurs in the Southeast.

During the past 21, years Harry has spent a vast amount of time helping the widows and surviving family members dispose of electronic equipment left behind. Last month marked the 30th time that Harry provided such help by arranging to dispose of equipment that a family did not understand, did not want and did not know how to get rid of in a profitable way. The net value of the equipment in some of these estates exceeded $10,000! Much of our electronic equipment heritage has probably ended up in the landfill because no one understood its value.

(Continued on page 17)

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THE • ADVENTURES • OF

Dan & Burke

An ROTC Riot

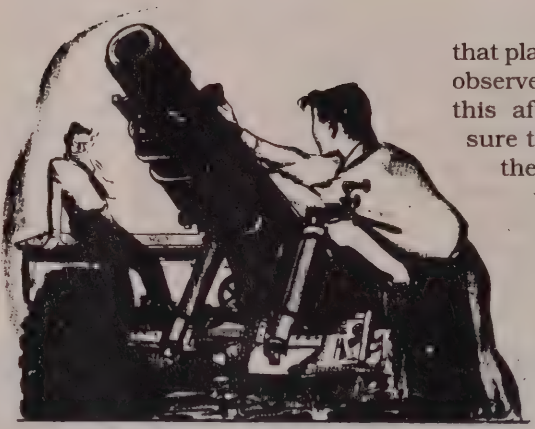
Dan and Burke were alone in the big armory building on the campus of Parvoo University. As physically fit high-school students, they were allowed to volunteer for military training during their Junior and Senior years. Both boys belonged to the Army's Reserve Officer Training Corps, familiarly known on the campus as "rot-see," and that is why they were in the armory. Strictly speaking, that is why Burke was in the armory. At the suggestion of his lieutenant, he was working off three demerits by polishing the howitzer. Dan was keeping his buddy company and providing some dubious moral support.

"You missed a spot there by the breech," he pointed out critically from where he lolled lazily on a bench. "How did you goof up this time and give old Zimmie a chance to gig you?"

"My shoulder brass was a little tarnished—or so dear Lieutenant Zimmerman complained," Burke answered. "I don't see how it could be with all the rubbing I've done, but I'll have to admit my brass doesn't shine the way yours does. Yet I never see you making with the Brasso and Blitz-cloth. How come?"

"Oh, didn't I tell you?" Dan asked, affectedly smothering a yawn. "I take my hat and shoulder brass to chem lab with me and dunk them in a weak solution of sulfuric acid. Works fine. Polishing is for peasants."

"Now you tell me! With friends like you, who needs enemies? But Lt. Zimmerman is a real clown, and I'll bet his granddad was in the Prussian Army. He really loves to ride me. 'Mr. Bishop,' he says in that nasty-nice voice of his, since you can't seem to clean little things, suppose we see what you can do with something bigger. I expect that howitzer to sparkle!' Have you heard his latest?"



"Nope."

"As you know, he's drilling us for Corps Day. He's taped a whole drill he intends to feed into the armory public address system so he 'may better observe the reaction time of the troops to spoken orders.' Get a load of this," Burke said, as he walked to a table at the end of the armory and switched on a cassette recorder. In a few seconds the voice of Lt. Zimmerman could be heard barking out occasional commands against the steady beat of a metronome. Music was playing very faintly in the background.

"Hey, do you hear that? The local broadcast station is getting into that playback amplifier a bit," Burke observed. "Zimmie was over here this afternoon checking to make sure the commands were given at the right time so that the squad wouldn't run into the armory walls when they started at the right spot and were pointed in the right direction. You'd think he was bucking for general instead of being just a Parvoo senior in rot-see. If I dared, I'd like to put a few commands of my own on that tape just to foul him up-"

Burke's voice trailed off and his eyes took on the glassy look they always wore when he was in the throes of electronic inspiration. "Say, Dan," he said eagerly, "do you still have that little two-meter AM transmitter you built last year?"

"Sure. I was checking it out last night, and it works fine; but why?"

"Be a good head and go get it while I keep burnishing the loudenboomer. I want to try something."

Dan went with alacrity, for he knew that when Burke got that look interesting things usually happened. It was only three blocks from the armory to his home; so he was soon back carrying a compact little two-meter AM signal generator/transmitter about the size of a cigar box.

Burke started the cassette again and placed the transmitter on the wooden table beside it. He flipped on the transmitter, and anything he said into the transmitter microphone blotted out and rode over the top of anything playing from the cassette.

"Fine, fine!" he exulted. "Now let the tape play all the way through and write down the exact time that elapses from the start to the end of each order and the nature of the order. I'll finish polishing; and then back to the house! We have work to do tonight."

After they had supper, Dan and Burke locked the door of the room and started on their project.

"What I have in mind," Burke explained, "is to put some commands of my own on the tape of this miniature, cassette tape recorder and feed the output into the two-meter transmitter. As you saw this afternoon, any time that transmitter is turned on in the vicinity of the tape recorder in the armory, the very strong RF field overloads the first amplifier transistor in the cassette recorder and forces it to make like a receiver. Under those conditions, any modulation on the transmitter carrier feeds right through the amplifier in the recorder."

"Why does RF do that?"

"A strong RF signal that reaches the base of the input transistor swings the base positive on positive half-cycles of the RF. During these swings, the base attracts electrons from the emitter, which must flow to ground through the base resistor. Trapped electrons piling up on the base will bias the transistor negatively to the knee of its characteristic curve, and it becomes a detector instead of an audio amplifier.

"That's why ham rigs are often heard on tape recorders, stereo amplifiers, public address systems, electric organs, broadcast radios, and TV sets, even though the ham transmitters are functioning perfectly normally and legally. Police and taxicab radios do the same thing. For this to happen, the RF field must be intense, which means that it only occurs near the transmitter. The condition is often aggravated when the transmitter frequency is high and wavelength is short.

"Aw, sure! I remember now. The *ARRL Handbook* explains how the condition can usually be corrected by installing a simple resistance/capacitance filter in the input circuitry. But are you going to let the transmitter run all the time the tapes are playing? The RF will blank out the other tape."

"I know, and I don't want to do that. I want to use some of Zimmie's orders and some of my own. We'll rectify part of the audio output from my own cassette recorder with a silicon diode and use the developed DC to operate a little relay that turns on the transmitter. We'll put enough capacitance across the relay coil so that the stored current will hold the relay closed between words. That way the transmitter will turn on every time one of my orders starts and will cut off a second or so after the order is given. When Zimmy checks his own tape, it won't be changed or recorded differently than his original commands."

Actually marrying the tape recorder to the transmitter was an easy job for Dan and Burke, and it was still early in the evening when they slipped into the still-empty armory carrying a small box that housed both the transmitter and Burke's miniature recorder. This box was concealed in the space behind a desk drawer, and a tiny Microswitch was mounted so that when the drawer was shoved in the last sixteenth of an inch the tape recorder and transmitter were ready to activate.

They turned on both recorders and were delighted to discover the timing on the tape Burke had made was perfect. The few orders he gave substituted perfectly for those of the lieutenant that were covered up. When the volume control of the cassette recorder was carefully adjusted, it was very difficult to tell who was giving the command. Like Rush Limbaugh, Burke was an excellent mimic.

Satisfied, they carefully rewound both tapes, pulled out the desk drawer a fraction of an inch, and went back to their homes and to bed. It would be nice to report that their consciences kept them awake, but they slept like a couple of corpses.

Drill for the boys did not come until late in the afternoon of the next day. Anticipating the discomfit of their thoroughly disliked drill instructor, they looked forward eagerly to the event, and finally it arrived. Dan managed to stand close to the desk until the lieutenant switched on the cassette recorder. At the precise moment the officer pushed the "Play" button, Dan nudged the drawer shut with his knee and went to join Burke in the drill squad. He had been so intent on performing this critically-timed operation that he did not notice a man, smartly dressed in a regular Army uniform, who had entered the hall and was now standing quietly by the door.

"You didn't start the thing-I hope!" Burke whispered fervently out of the corner of his mouth. "See that silver star on the uniform of the stranger? He's a Brigadier General. Must be doing a little inspection of ROTC performance. You didn't start it, did you ?"

"It's off and running," Dan whispered back. "Stand by for court-martial!"

At this moment Lt. Zimmerman noticed the distinguished visitor; and, after a shocked double-take, he threw him a snappy salute. The general returned the salute and waved for him to carry on.

The tape had already started delivering a little sermon from Lt. Zimmerman on military obedience: "A good soldier obeys every order of his commanding officer instantly, resolutely, and unquestioningly, no matter how foolish the command may seem at the moment. That is the basis of our drill today. Until the cassette recorder says otherwise, it represents your commanding officer. No matter how much any other person-including the sergeant or myself-may try to dissuade you, you shall carry out your orders unflinchingly. Fall in!"

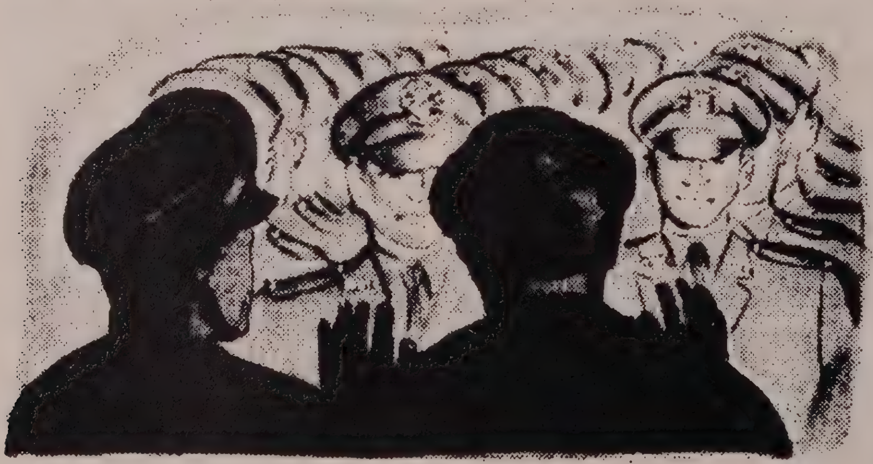
As the squad started to go through the maneuvers dictated by the tape, Lt. Zimmerman sauntered over and shook hands with the general, who was still standing near the door, close to a wall. Dan and Burke were sweating copiously, and not from the heat in the hall, as they marched the length of the armory, made a left turn, marched across the end, made another left turn, and started back. Both boys were trying desperately to recall the orders Burke had put on their tape and to picture the probable result when these orders started coming through the speakers. They were not left in doubt for long.

The squad marched smartly past the two officers. Then the first of the spurious orders barked from the speakers. The squad turned to the left. In a few seconds a command in Lt. Zimmerman's voice turned the men left again. Then, when they were squarely opposite the two officers, another of the false commands turned them left once more and they started marching straight at the general and the lieutenant.

The face of the lieutenant, as he watched his men march toward him, wore a look of mingled puzzlement and anger; but as they came relentlessly closer, the look changed to something similar to horror.

"Stop! Company halt! Aw, cut it out, fellows!" his voice trailed off in a most unmilitary wail; but not a man even hesitated. They marched straight against the two officers, forcing them backward, and pinned them against the wall while the soldierly legs still pumped up and down in a rhythmic one-two one-two one-two.

Mercifully, the tape recorder finally gave an order to about-face, and the freed lieutenant ran over and stopped the tape recorder. Serious as the situation was, Dan and Burke could hardly keep from grinning as they saw him lift it off the desk and run his hand all around it in a vain search for hidden wires.



"Lieutenant," the red-faced general said sternly, as he tried to restore a crease to his trouser legs that had been rumpled and soiled by the scraping shoes of the squad, "may I suggest that you dismiss the company? I think we should go into the office and have a little talk about the danger of allowing your command to leave your control, even for a few minutes."

As soon as the door closed behind the angry general and the sheepish-looking lieutenant, the rest of the boys filed out of the armory, still chattering excitedly about the strange happenings. Dan and Burke stayed only long enough to retrieve the little box from its hiding place behind the drawer.

"Whew, that was close!" Burke said as they started at a quick trot back home. "I only wanted to march the squad into a wall and let Zimmie see how it feels to be made to look foolish in front of everybody. I actually felt sorry for him when the general was chewing him out, but maybe he'll be a little more tolerant from now on."

"Okay, but let's hurry," Dan said, looking back over his shoulder. "I'm not going to rest easy until we've dismantled this handy-dandy little electronic sergeant and erased the tape. That general had a firing-squad look in his eyes! "

Dan and Burke is based on a storyline created in 1954 by John Frye, W9EGV. The boys are the sons of John's original characters, Carl and Jerry.

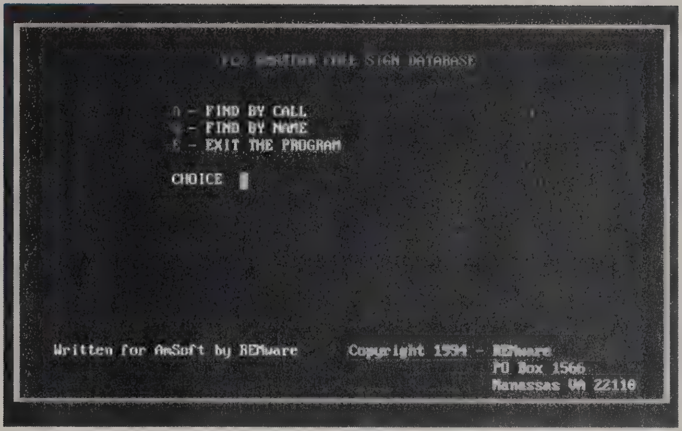
John Frye is no longer with us. But while he was alive, John was an avid Amateur Radio operator who wrote about young people—for young people.

It's doubtful that anyone could make John's stories more interesting or improve on his words. We'll settle for giving them a 1990s twist.

For more information about amateur radio, please contact NARA.

Review— The World Of Ham Radio

by NARA Staff



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                 FCC AMATEUR CALL SIGN DATABASE

           A - FIND BY CALL
           B - FIND BY NAME
           E - EXIT THE PROGRAM

           CHOICE █

Written for AmSoft by REMware     Copyright 1994 - REMware
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HAMS ARE adding CD-ROMs to their computers in record numbers. At any ham convention, you will observe add-on drives purchased like floppy drives used to be three or four years ago. In many cases, hams can pick up older manufacturer closeouts for around $100!

You'll also see many vendors selling an incredible array of software on CD-ROM, much of it developed specifically for Amateurs. One disk that caught our eye was "*The World of Ham Radio*," produced by AmSoft.

Looking at the contents of a CD-ROM is like exploring the pathways in a brightly-lit cave. Moving from one directory to another reveals even more "passages" to explore. And "*The World of Ham Radio*" is no exception. While TWHR is primarily a callsign data base, it includes a large quantity of useful software that we have not seen on other CD-ROMs. For example, there are a couple dozen programs in BASIC, but stored in ASCII, so you can modify them with your word processor.

There are more than 7,000 IBM compatible files, which include such things as antenna programs and calculators, engineering files such as circuit analyzers, parts catalogs from Motorola and a PLL designer from Phillips, virtually every ham examination program ever written, formulas by the bucketfull, dozens of Packet and BBS programs, SWL and scanner data bases, plus Windows programs (over 300 ham bit-mapped images) and even a Russian language tutor program!

As you can tell, we were very impressed with the AmSoft disk. The primary focus of the disk is the call letter lookup database. The lookup program responds very fast to the entry of either a name or call letters. The user screen is rather modest, but this certainly does not affect the performance of the program. The call sign data base seems accurate and up-to-date.

"*The World of Ham Radio*" is priced at $40.00 with a $3.00 shipping and handling charge. If you want more information, contact AmSoft at PO Box 666, Cumberland, PA 17070-0666 or phone (717) 938-8249 or FAX (717) 938-6767. ❑

ARE YOU EXPECTING YOUR LICENSE SOON?

The following is a list of the FCC's most recently issued call signs as of March 1.

District	Group A Extra	Group B Advanced	Group C Tech/Gen	Group D Novice
0	AA0QI	KG0LO	++	KB0LYV
1	AA1IV	KD1TZ	N1RMF	KB1BGS
2	AA2RH	KF2UA	N2YBR	KB2QXD
3	AA3HG	KE3MC	N3RPA	KB3BBC
4	AD4QG	KR4NY	++	KE4KAL
5	AB5TB	KJ5VI	++	KC5EUX
6	AC6AP	KN6YT	++	KE6EJD
7	AB7BL	KI7WH	++	KC7FON
8	AA8OI	KG8HH	++	KB8RSM
9	AA9KI	KF9UM	N9WHC	KB9IXF
Hawaii	++	AH6NF	WH6SV	WH6CRD
Alaska	++	AL7PO	WL7QW	WL7CHL
Virgin Is.	WP2G	KP2CC	NP2HG	WP2AHU
Pue. Rico	++	KP4WM	++	WP4MNW

++All call signs in this group have been issued in this area.

FCC SAYS REPEATER TRUSTEES CAN BAN USERS!

Civil Court Orders Ham Off Repeater

by Bert Hicks, WB6MQV

THE FEDERAL Communications Commission has issued a letter of interpretation that validates the authority of repeater system licensees to ban duly licensed radio Amateurs from operating over their open repeaters. The interpretation comes as a result of a request for clarification sought by attorney Sidney Radus, N6OMS, of Orange, California. Radus is the attorney representing the Claremont Amateur Repeater Association in its fight to regain control over the way that its club repeater systems are used and who can have access to them.

In preparation of a civil complaint against one unwelcome user, attorney Radus wrote to the FCC's Private Radio Bureau to find out exactly where his client stood in regard to operation of a repeater station as outlined under Part 97.205(e) of the Amateur Service rule. His fax was answered by Personal Radio Branch Chief John B. Johnston, W3BE. Johnston is well versed in Part 97 regulatory matters; his was the guiding hand that crafted the latest version.

CALIFORNIA JUDGE SAYS FCC SHOULD ACT AGAINST KJ5KE

A man described as a "disgruntled former member" of a Southern California Amateur Radio club has been ordered by a civil court to stay off the organization's repeaters or face the possibility of going to jail. The action against Tim W. Seawolf, KJ5KE, of Quail Valley, California. took place on February 8, 1994, and is precedent-setting in that the matter was handled as a civil action that places KJ5KE under a three-year restraining order to keep his distance from all frequencies used by the Claremont Amateur Repeater Association.

CLARA attorney Sidney Radus, N6OMS, told the Amateur Radio Newsline that the club filed a civil harassment action against Seawolf after the former member began harassing a number of people on the system. He was asked to cease this type of operation but refused to cooperate. As a result, there were several attempts made last summer to obtain a restraining order against him. One club member was successful, but the terminology used in that particular court order made it almost impossible to enforce.

> A man described as a "disgruntled former member"...has been ordered by a civil court to stay off the repeaters...

In January, the radio club decided to file yet another measure in the form of a civil harassment action against KJ5KE. Such an action is only possible where the alleged intimidation has produced emotional distress. As such, it is a harder case to prove, but if sanctioned by the judge it becomes a far more restrictive type of ruling than a simple restraining order. Under California law, the violation of a Civil Harassment Order is a misdemeanor punishable by up to a $1,000 fine and six months in county jail each time it is disobeyed.

Using this as its legal framework, the CLARA organization had Seawolf served with the initial order and a date was set for a hearing to determine whether to make the petition permanent. The hearing was held in Department 609 of the Superior Court in and for Orange County before Judge Daniel J. Didier. It turned out that Judge Didier is an Advanced Class license holder with the call sign KD6FN. On learning that he had been assigned the case, Judge Didier noted to the court record on three occasions before the hearing began that he was a radio Amateur, was aware that the CLARA repeater existed and had listened to it on several occasions. Each time defendant Seawolf, who was not represented by counsel, declined the judge's offer to withdraw from the case.

Evidence introduced by the radio club included the testimony of club President Gary Crist, KI6FG; the repeater call sign holder Roy Lothringer, N6SLD; and club secretary Jackie Cadotte, KD6FRY, that each had suffered emotional distress as the result of what Seawolf had allegedly said to them and others over the repeater along with recordings of KJ5KE's on-air verbiage. Also entered into evidence was a letter from John B. Johnston, W3BE, Chief of the FCC's Private Radio Branch, that said that there is an unqualified right for the owners of any repeater system to prohibit anyone from using it.

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON D.C. 20554

Feb. 1. 1994
In Reply Refer To:
Mr. Sidney L. Radus
Orange Ca. 92669

Dear Mr. Radus,

This is in response to your fax dated January 14, 1994, in which you request further response to your previous correspondence. Specifically, you request whether Section 97.205(e) permits owners of "open" repeaters to limit the use of their repeaters to certain users.

Section 97.205(e) states: '... Limiting the use of a repeater to only certain user stations is permissible. "The rule section applies whether a repeater is coordinated as an "open" or "closed" repeater. Further, the rule applies without regard as to whether a repeater is coordinated at all. Rule 97.205(e), without qualification, permits the individual responsible for proper operation of a repeater to limit the use of a repeater to certain user stations.

I trust this is responsive to your concerns.

Sincerely,
John B. Johnston
Chief, Personal Radio Branch

In his defense, Seawolf testified he had the Constitutional right to say what he wanted, anytime and to anyone, using any medium he chose and therefore the entire proceeding was without merit. He attempted to call several witnesses to to validate this, but the court found none could be considered "expert witnesses" in the legal sense and each was summarily disqualified.

After a short deliberation, Judge Didier decided to issue the restraining order against Seawolf. He barred him from using any of the CLARA repeaters, instructed him to not interfere in any way with any of the repeaters' input or output frequencies, and restrained him from annoying, harassing or molesting any member of the Claremont Amateur Repeater Association. KJ5KE was also assessed $2,100 in attorney fees, $182 in legal filing fees and the $175 cost of service of the petition. Judge Didier then brought the matter of Seawolf's on-the-air behavior into the official court record. He ordered the attorney for the plaintiffs to turn over a copy of the hearing transcript along with the audio tapes used in evidence to Los Angeles FCC Engineer-in-Charge James Zoulek. He also condemned Seawolf's on-the-air activities, describing them as among the most despicable things he had ever heard on Amateur Radio. Judge Didier also told KJ5KE that if it were within his power to do so, he would immediately revoke Seawolf's Amateur Radio license.

According to attorney Radus, the court decision in favor of the CLARA organization is a first step in returning the club's repeaters to use by its members. He noted that others hams who supported Seawolf's activities may also be subject to actions for civil trespass to private property or criminal complaints for "theft of use, a misdemeanor." Radus did say that at least a dozen notices are being sent to hams throughout the area who are accused of being the sources of harassment to the CLARA repeaters and the organization's members.

Attorney Radus used this regulatory interpretation as evidence at a restraining order hearing against a former member of the Claremont Amateur Repeater Association. It was accepted as evidential material by an Orange County, California Superior Court which sided with the radio club and granted its restraining petition that banned Tim W. Seawolf, KJ5KE, from operating on any CLARA repeater for the next three years.

But looked at on a much broader scale, this latest interpretation of Section 97.205(e) says that no operator acquires any additional rights to use a repeater system just because it is listed as "open." A repeater licensee—or control operator by extension—can operate a system as "open," yet deny permission for anyone he chooses to use it.

In essence, this interpretation of Section 97.205(e) by Johnston means that any ham who enjoys the use of a repeater, regardless if it is "open ... .. closed," "coordinated" or "uncoordinated," does so under the authority of the repeater station licensee. Further, a repeater license holder has the authority to ban any radio Amateur from operating through his relay device, and that those so banned have no regulatory recourse. This is truly a precedent-setting interpretation by the FCC and one that may forever change the way in which repeaters are operated.

73 de Bert Hicks, WB6MQV ❑

This important information appeared in Westlink Report, published by Burt Hicks, WB6MQV. For subscription information on this useful newsletter, write Westlink Report, 28221 Stanley Ct., Canyon Country, CA 91351 or call their toll-free number, 1-800-HAM-7303.

Editorial Rebuttal

by Hans Brakob, K0HB

This article is in response to the editorial in the March/April issue of The Amateur Radio Communicator about closed repeaters.

While I understand the general thrust of your editorial, and share your concern for "fair access" (notice that I didn't say "free access") to the spectrum which is set aside for repeater operation, I fear you may diminish the credibility of your position by grossly overstating the situation. Incidentally, please do not construe this message as an "argument" against your position, but rather a different view of the situation.

Here in the Minneapolis/St. Paul metro area, I count a total of 85 coordinated repeater pairs between 29.5 and 928MHz, with several dozen more coordinated pairs within a 75-mile radius. As anywhere else, I suspect a small number of those are inactive "paper" repeaters, but our coordinating group requires a yearly "certification of use" which seems to quickly recover inactive pairs for re-assignment.

Out of all these machines, far and away the majority (more than 95 percent) are open machines. Even the "big" wide-area machines maintain this status, including not only open casual use, but also access to ancillary functions such as any autopatches, links, etc. In my experience, our situation here in Minneapolis is not unusual. My employment requires me to travel quite extensively, including to your area and to Southern California. In all these travels I have NEVER found it difficult to gain access to a variety of local repeaters.

Now here is where the "free" vs. "fair" access issue arises. In our area (and I suspect most other locations) an individual who regularly uses a particular machine will very likely be encouraged to help support that machine, either by joining the supporting club or contributing some nominal amount if the machine is privately maintained. What this means is that a newcomer will typically use a variety of machines at first, then sort of adopt one (or a few) for regular use. It is at this point that the sponsor generally approaches the individual to solicit their support, and in fact some groups may discourage further use if the individual declines to help with support. An unreasonable person might now consider this system "closed". So be it.

I believe this system is fair, in that it distributes the financial cost of these machines (which can be considerable) to those who use them. Lacking this distribution of costs, few individuals could afford to build and maintain these facilities "free" for use by everyone, and most would be abandoned or of such low quality as to be useless. Coincidentally, the machines with the better coverage or more complete features tend to draw the most supporters, so sponsors are thus "encouraged by the market" to keep their machines in good shape and with desirable features.

Thus, I believe the idea of "free" access to be specious and unworkable. On the other hand, "fair access" has proven very successful in our area.

73, de Hans, K0HB ❑

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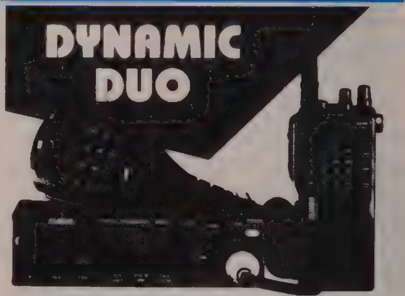

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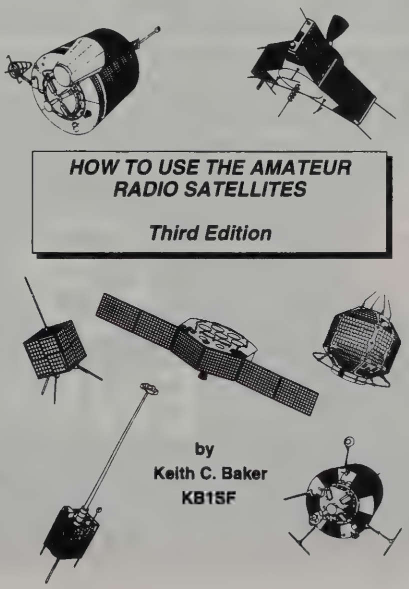
How To Use The Amateur Satellites

by NARA Staff

WHERE DO you get information on what ham radio satellites are in orbit and how to work them? If you join AMSAT, you get all this information and more in "How To Use The Amateur Radio Satellites," written by Keith C. Baker, KB1SF. This book is used almost daily here at NARA and has proven to be an invaluable guide for both "SWLing" the "birds," as well as for communications. The book draws some of the more practical aspects of Amateur Radio satellite operation together into a single reference document for the casual listener or beginning user. Keith includes an excellent section of beginner information called "Operating Notes." In addition, he describes in detail each of the popular Amateur Radio satellites in a single satellite per page format. This allows users to place the document in a three-ring binder, replace pages as required and jot notes on each satellite as it is heard or worked.

Information on each satellite includes country and date of launch, NASA ID, International ID and orbital data. Equally useful is the Frequency and Mode data. Remember that some satellites operate digital (in various formats), voice on FM or single sideband and even CW. Uplink and downlink frequencies are given, as well as those used by beacons, robots and telemetry channels.

As an inducement to join the Amateur Satellite Corporation, AMSAT offers a free copy of "How To Use The Amateur Radio Satellites" and a free tracking program called ORBITS, written by W0SL. Observant readers will note that the AMSAT offer on Page 18 of our March/April 1994 issue expired about the time the issue arrived at their mailbox. However, we think if you contact AMSAT at PO Box 27, Washington, DC 20044 or call them at (301) 589-6062 and say "it's all Don Stoner's fault," they will extend the offer for you. Don't miss out on this great opportunity to join the organization that has been primarily responsible for putting all those satellites in orbit. ❑



HOW TO USE THE AMATEUR RADIO SATELLITES

Third Edition

by

Keith C. Baker

KB1SF

Shopping For CW Keys?

If so, take a look at a British-produced *Twin Lever Paddle* handmade by Gordon Crowhurst, G4ZPY, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs L40 7TG, England. The paddle looks like a miniature Gatling gun. It's mechanism is brass polished to the lustre of fine gold and filled with silver screws. The TLP sits on a black steel base and has wide oval amethyst-color fingerpieces to give an overall appearance of fine jewelry. This paddle has thick arms that defy abuse, extremely precise adjustments and is marvelous.

Got a tiny rig? How about a tiny key, such as G4ZPY's new "*baby*" miniature pump key. This delight measure only one-inch square, has all the precision adjustments found on larger keys, and it really works.

Another of Gordon's keys is the gold "*Trophy*" model hand-pump key. This extremely precision key is made of 18 karat gold-plated brass mounted on a beautiful mahogany base. Fine ball bearings are used at the fulcrum, and the key's contacts are silver-coated and set into teflon insulation. This delight looks like the finest Beverly Hills gold and handles great. You can purchase the Twin Level Paddle, the world's smallest key or the Trophy model by writing Gordon at the address above.

Here in the U.S., how about a round and triple-chrome plated paddle with jade-colored fingerpieces? It is the elite dual-lever "*Mercury*" custom-made keyer by Steve Nurkiewics, N2DAN/4 at 1385 Abner Street, Port Charlotte, FL 33980. This four-pound paddle uses magnets instead of springs, handles like a dream is built to last forever and is a collector's pride. There is usually a waiting list for this key and it is not a low-cost item (but neither are champagne and caviar).

LETTERS

WE NEED A 21ST CENTURY ORGANIZATION

Dear Don:

CW is a fun mode of communications and just that. It should not be used as an obstacle to gain voice privileges on the HF bands. If it is allowed to remain as an obstacle, then typing speeds should be incorporated into the present regulations for the use of packet.

We are looking for an organization that will move Amateur Radio forward into the 21st century and not one that is content with keeping it in the 19th century. If your organization's goals advance Amateur Radio, then it's the time for a Novice, Technician and Technician Plus organization.

73, Gene & Anita Tallent,
KD4QEN/KE4GRN,
Warner Robins, Georgia

Right, guys. I have always maintained that a Morse code test was simply a filter to separate the motivated from the unmotivated, nothing more—nothing less. However, that is not to say that another type of "filter" would not accomplish the same thing.

WHAT RIG SHOULD I BUY?

Dear Don:

I wrote to you once before thanking you for writing the book "How To Earn Your No-Code Ham License." I just received my license a couple of weeks ago after an 8-week wait. I have been having trouble getting advice on what to buy (my first radio). The local ham radio store guy says "they are all about the same," and can't seem to answer my question as to why some cost $200 and some cost $400. Any tips would be appreciated.

Once again I would like to thank you and the people at NARA for the help you have given me so far. Your organization is a real lifesaver for a beginner like myself.

73, Steve Wolfcale,
W9WAT

Thanks for the kudos, Steve. I am a great believer in word of mouth. Before you invest three figures in a handheld, you should (a) make sure they are advertisers in The Amateur Radio Communicator and (b) talk to other hams with these types of radios and see what comments they offer. The user is in a far better position to answer your questions and offer you guidance. Often the sales person is too busy to give you the attention you deserve and, once in a while, they have built-in bias toward "no-coders."

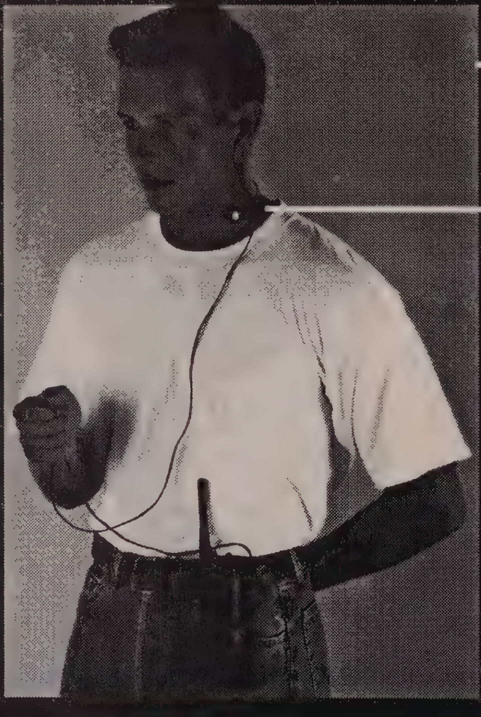
Dear Don:

Today I read your publication, *The Amateur Radio Communicator.* One item really irritated me. Matt McCullar defines subtones as passwords to restrict non-member access to a repeater. While this may be the case in some locations, I know of no repeater, two meter or otherwise, in the northern Ohio area that uses subtones to a political end. I and others use subtone as a tool to limit co-channel interference, commercial intermod interference and storm QRN—in short for strictly technical reasons.

Another item worth mention, Bill Pasternak's Washington Newsline section does not hesitate to name names when an individual is found guilty of misdeeds. Why not name names when the FCC takes action against manufacturers, marketers and dealers of illegal CB targeted equipment. The good reputation of Amateur Radio is being defamed by these people and their practice of making and selling obvious CB intended equipment in the name of ham radio.

73, John C. Thomas, AB8Z,
Parma, Ohio

Matt should not have generalized on the use of tones. I suspect you live in a very "laid back" area of the country, John. In the bigger cities, tones are commonly used to regulate who can and who cannot use a given repeater. Here in Florida most two-meter repeaters are open and use tones for the same purposes as in your area. However, on 440 MHz, most repeaters are closed and I am sure that in most cases it is for



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"political purposes," as you say. Regarding naming names, no one is reticent about doing that SO LONG AS the FCC mentions those names in their news release. Otherwise, we (Bill and anyone else) winds up getting sued. Lately, I have not seen very many names named.

DUMBING DOWN OUR SCHOOLS

Dear Don:

Here is the reason vouchers failed (and should have). According to Dr. Murray Rothbard, "control always follows subsidy," and asserts that the voucher scheme would extend government domination from the public schools to the as-yet more or less independent private schools." Vouchers lost big because people wanted to protect their communities against state deprivations. The voucher advocates got precisely what they deserved."

73, David A. McCauley, WJ2F,
Whiting, New Jersey

That is about the dumbest reason to reject the voucher concept, that I have ever heard. In other words, let's not use vouchers because the government will control their disposition. That makes as much sense as to suggest we not install traffic lights and stop signs because government will make rules regarding their use. While I appreciate your suggestions for "fixing the existing public school system, David, that is like trying to repair the Communist political system. It and they are beyond repair. It is time for an alternate way to educate our youngsters!

Dear Don:

I agree with you 100% on the problems of education in this once great country. One thing that might explain the problem could be the fact that our children are being educated by liberal arts graduates. They have been taught that normal people cannot function without guidance of Psychologist, counsellors, etc. The main course in most grammar schools today is how to get along with other children in the class. It should be the work ethic.

Amateur Radio is the only endeavor or service in the world that does not reward their members for hard work, following the rules and longevity. My case in point, in 1961 I passed the test for Technician grade. I just barely got by the five words-per-minute. In have never been able to pass the thirteen words-per-minute. So for thirty years of experimenting, obeying the rules and teaching more than a score of kids how to be a ham,. I am still relegated to the worst portion of all bands and have to wait for the sun cycles to work any DX at all. I am now sixty-six years old and I may not be around for the next one.

Keep up the good work with the youngsters. They are the only hope ham radio has left.

73, George H. Berger, N6HDK,
Valley Springs, California

I agree with you on many points, George. But don't knock 10 meter DX. The notion that it shuts down for six years is poppy-cock. I just worked Denmark with a Uniden.

TO: Don Stoner, W6TNS
National Amateur Radio Assoc.

Join The Dialog!
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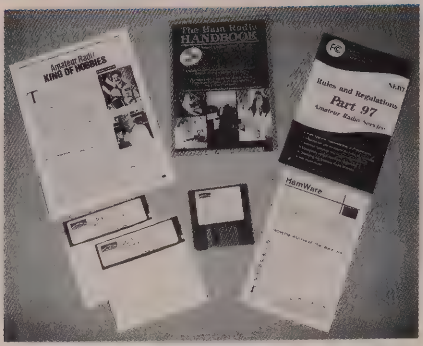
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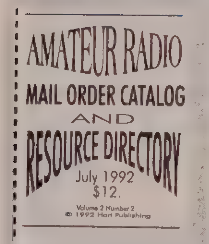

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- *Amateur Radio—King of Hobbies*
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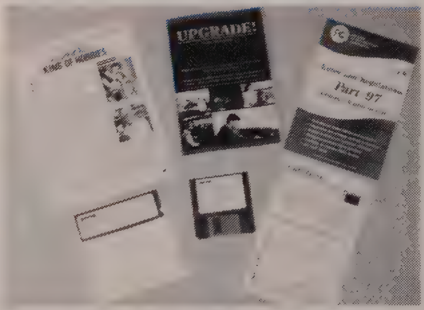
Save by ordering the **NARA Amateur Training Package.** This entire package (5¼" and 3½" disks) is only **$32.95 ($3.00 S&H)** #S220.



Upgrade to General Class with the NARA UPGRADE Package

NARA has put together all the essential tools you'll need to upgrade to General class. This value-packed offer includes:

- *UPGRADE! to General Class* by W6TNS
- HamWare General Class IBM (5¼" and 3½" disk) testing software w/Morse
- 60-page *FCC Rules and Regulations, Part 97*
- *Amateur Radio—King of Hobbies*
- An extensive list of Contact Volunteer Examiners

The **NARA Upgrade Package** is available at Amateur Radio equipment dealers or directly from NARA for only **$29.95 ($3.00 S&H)** #P240.

A FREE issue of ***The Amateur Radio Communicator*** will be mailed to you at a later date when you order any NARA product!

How to Get Started in QRP

NEW! Introduction to QRP!

NARA does it again with its ***How To Get Started in QRP*** book. QRP (meaning low-power operation using five watts or less) offers a unique and exciting challenge for today's ham. Written by Dave Ingram, K4TWJ, "*QRP*" covers an overview of QRP, accessories, operating tips, power sources, homebrew, clubs, awards and more. With today's technology and equipment, working the world with QRP could be the ultimate challenge! ***How To Get Started in QRP*** is available at all major ham radio stores or directly from NARA for only **$9.95 ($2.00 S&H)** #B690.

MacHam™ Testing Software

MacHam is one of the most useful series of ham radio programs written for the "Mac." All required circuit diagrams are displayed with the question on the screen. If the test is printed, the diagrams are included.

The tests can be taken on screen, by element or by chapter, with options of immediate or end-test scoring. Printouts create exact VE style exams, with question pool numbers, correct and blank answer sheets.

- MacHam Nov/Tech #S310 **$39.95 ($2.00 S&H)**
- MacHam General #S311 **$29.95 ($2.00 S&H)**
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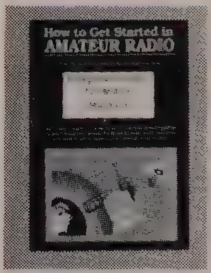
- MacHam Extra #S313 **$29.95 ($2.00 S&H)**



How to Get Started in AMATEUR RADIO

NEW! *How To Get Started In Amateur Radio*

Learn things about your handheld radio that the instruction manual forgot to mention. Don Stoner's new information booklet, *Understanding Your Handheld Radio* (#B701), completes your knowledge of controls, switches, antennas, specifications and accessories.

Bill Pasrernak, WA6ITF, has written the second book in the 'getting started" series called *A Beginner's Guide to FM And Repeaters* (#B702). He fills in your knowledge on operating on repeaters, your first QSO, and so on. ***How To Get Started*** **booklets** are priced at **$3.95** from all major ham dealers or direct from NARA **($1.00 S&H).**

Order Today!

Learn the Code with these Outstanding Cassette Tapes!

These cassette tapes will give you the practice you need to pass your code exams. Each set contains two cassette tapes. Each set sold separately.

- Novice/Technician Class 0 to 5wpm #T710.
- General Class 5 to 14wpm #T720.
- Extra Class 12 to 24wpm #T730.

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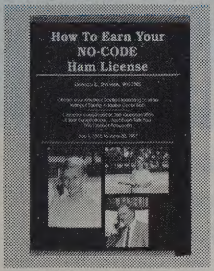


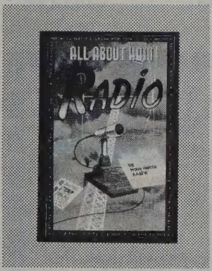
How To Earn Your No-Code Ham License

By Don Stoner, W6TNS, is the leading book for anyone wishing to earn the new code-free Tech license. Includes every question plus the multiple-choice answers.

How To Earn Your No-Code Ham License is the only test manual that includes simple and easy-to-understand theory along with many photos and illustrations.There are ten chapters covering each subelement. Sample tests are given at the end of every chapter with a list of correct answers at the back of the book.Guaranteed to provide all the information needed to get your ham radio license or your money will be refunded. ***How To Earn Your No-Code Ham License*** is only **$9.95 ($2.00 S&H)** #B610.

FCC Rules and Regulations

The FCC, Rules and Regulations Part 97, covers the guidelines and rules of the Amateur Radio service. This 60+ page book is an excellent reference for every class of license; a resource book no ham shack should be without! ***Rules and Regulations, Part 97, Amateur Radio Service*** is only **$4.95 ($1.00 S&H)** #B640.



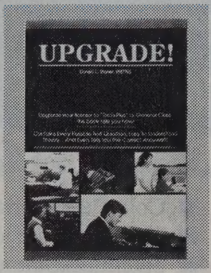
All About Ham Radio

This is the book that Don Stoner wishes he had written. Harry Helms, AA6FW, wrote this book in a manner that can be understood by everyone from young to old alike. Although not keyed directly to the question pools, it provides all the information you need to know to become a Technician Class Amateur.

Over 290 pages of jam-packed information including Hams And Their Radios, Customs, Habits And Other Good Stuff, Single Sideband, Ham Radio Meets the Personal Computer, Folklore, and much more.

For a book that covers so many different aspects of the Amateur radio hobby ***All About Ham Radio* is a steal at only $19.95 (3.00 S&H)** #B680.

Order Today!



UPGRADE! To General Class!

UPGRADE to General Class by Donald L. Stoner, W6TNS, shows "no-code" hams how easy it is to upgrade to the Tech-Plus or General Class license!

UPGRADE! has nine chapters covering each subelement of the General Class exam. All multiple-choice questions and answers for the General Class exam are included. Tips and special hints for learning the code and increasing your speed are also included!

UPGRADE! is available from Amateur Radio stores, or direct from NARA for **$9.95 ($2.00 S&H)** #B620.

Play It Up! With NARA's New Videotapes

Explore Amateur Radio through exciting videotapes! Directed by some of the best-known names in ham radio, these videotapes are the perfect addition to every ham's collection. Choose from the following:

Getting Started In Ham Radio. Covers the early stages of ham radio including station layouts, safety, choosing and setting up equipment and repeaters. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Getting Started On Amateur Satellites. A "how-to" guide for the newcomer wanting to work the world through Amateur satellites. Discusses equipment, DXing and more. By *CQ Videos*, **$19.95 ($3.00 S&H).**

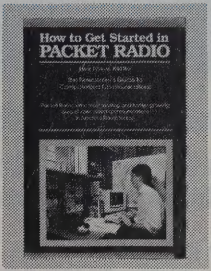
Getting Started in Packet Radio. A "how-to" guide to setting up a computer-to-computer station, getting on the air, QSOs, and operating packet effectively. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Getting Started in DXing. Successful DXers offer their tips on getting started, proper operating skills, snaring the rare ones, basic equipment and more. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Reading, 'Riting and Radio! Great for teachers and instructors, educator Carole Perry, WB2MGP, with her students and ham radio classes for children shows how beneficial and exciting ham radio is in school for teaching geography, world affairs, current events, math and more. **Only $19.95 ($3.00 S&H).**

CQ Field Day! Designed to help hams who want to set up their equipment in the great outdoors, this tape takes you to the award-winning 22A Field Day station. It shows you everything from setting up to packing up an outdoor radio station. **Only $19.95 ($3.00 S&H).**

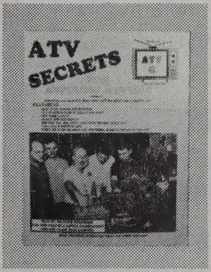
Ham Class. Well-known instructor, Gordon West, WB6NOA, helps prepare students and instructors to set up a ham class. The tape contains live classroom demonstrations and tips on setting up classes or training seminars. **Only $19.95 ($3.00 S&H).**



NEW!

Packet Radio For Beginners

NARA has done it again with ***How To Get Started In Packet Radio*** written by well-known author Dave Ingram, K4TWJ. This informative new book explains the practical side of packet radio in a simple-to-understand manner. It begins with a non-technical description of packet radio, followed by chapters including *Getting Started, Setting Up Your Station, Operating Packet to Networking* and *HF Operation.* There is even a *Packet Radio Equipment Survey* and an appendix that includes circuits for interfacing equipment! Get ***How To Get Started in Packet Radio* today for only $9.95 ($2.00 S&H).** #B670



ATV Secrets For Aspiring ATVers

ATV Secrets For Aspiring ATVers, written by Henry Ruh, KB9FO, contains everything you wanted to know about **Amateur Television (ATV)**. All ham licensees can participate in ATV—*even those with the new no-code license!* Amateur TV is fun and exciting. Take your own home video productions, make new friends and get more enjoyment from your video equipment. Hams should be *seen* as well as heard!

ATV Secrets is available through all major Amateur Radio equipment stores, or direct from NARA for only **$7.98 WAS $9.98 ($2.00 S&H)** #B630.

The FCC Question Pools—

Each booklet contains all the questions and answers for each license class. Does not contain explanations. Order your booklet by license class.

- Novice and Technician classes together (all the questions for the new code-free Technician class license) **$4.95 (S&H $1.00)** #B650.
- General Class **$3.00 (S&H $1.00)** #B651
- Advanced Class **$3.00 (S&H $1.00)** #B652
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NARA Is The *Only* National Organization

exclusively devoted to

Novice and Technician Class Amateurs!

Who Is The National Amateur Radio Association?

NARA is striving to publicize Amateur Radio to the general public, attract young people to the Amateur Radio Service, increase the stature and benefits of the Novice and Technician class license and save the various Amateur bands from confiscation by commercial interests.

Recently, Amateur Radio lost part of the 220-MHz band and, in some areas of the country, is in the process of *losing access* to another band (900 MHz).

We must get more people involved in the Amateur Radio Service so we can increase activity and retain our remaining Amateur bands.

NARA brings you an exciting future as an Amateur Radio operator!

Who Should Belong to the National Amateur Radio Association?

- Anyone interested in obtaining an Amateur Radio license
- New Amateur Radio operators of all classes
- Public and private school teachers who want to introduce their students to Amateur Radio
- Beginning Novice and Technician class Amateurs
- Elmers who want to assist beginners
- All Amateurs concerned about the future of the Amateur Radio Service

What Will You Gain when You Join NARA?

1. Knowledge to help you get the most from the Amateur Radio Service
2. You will insure a solid future for the Amateur Radio Service
3. You will be helping others become involved in Amateur Radio
4. Plus you receive our member journal, *The Amateur Radio Communicator!*

Join the National Amateur Radio Association and receive *The Amateur Radio Communicator!*

Here's What You'll Find in the *Communicator!*

- Colorful editorials by Don Stoner, W6TNS
- The electronic adventures of Dan and Burke
- Satellite communications
- Transmitter hunting
- Help passing your Novice or Tech exam
- Erecting your first antenna, propagation
- Types of Amateur Communication
- Pictures and news about other Novices and Technicians...The Future of Our Hobby
- Hot Tips—News you need as an Amateur
- Current information on the VE program
- Repercussions that regulation changes will have on the future of Amateur Radio

When you join NARA, your membership dollars will be used to *further these goals*. Let's face it—with a membership cost of only $10.00 per year, ***you won't find a better value in Amateur Radio!!!*** Join today! It's easy. Just complete the subscription form below and mail your check or money order. For the fastest service, call 1-800-GOT-2-HAM(1-800-468-2426) with your Visa or MasterCard number.

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HOW DID I GET THIS MAGAZINE?

ONE OF THE WAYS WE CAN TELL THE WORLD ABOUT the goals and ambitions of the National Amateur Radio Association is to supply complimentary copies. We send about 10,000 pieces to newly licensed hams. This magazine is also mailed to a select list of people who might be interested in becoming Amateurs. We also send approximately 10,000 copies to NARA members and prominent people in Amateur Radio.

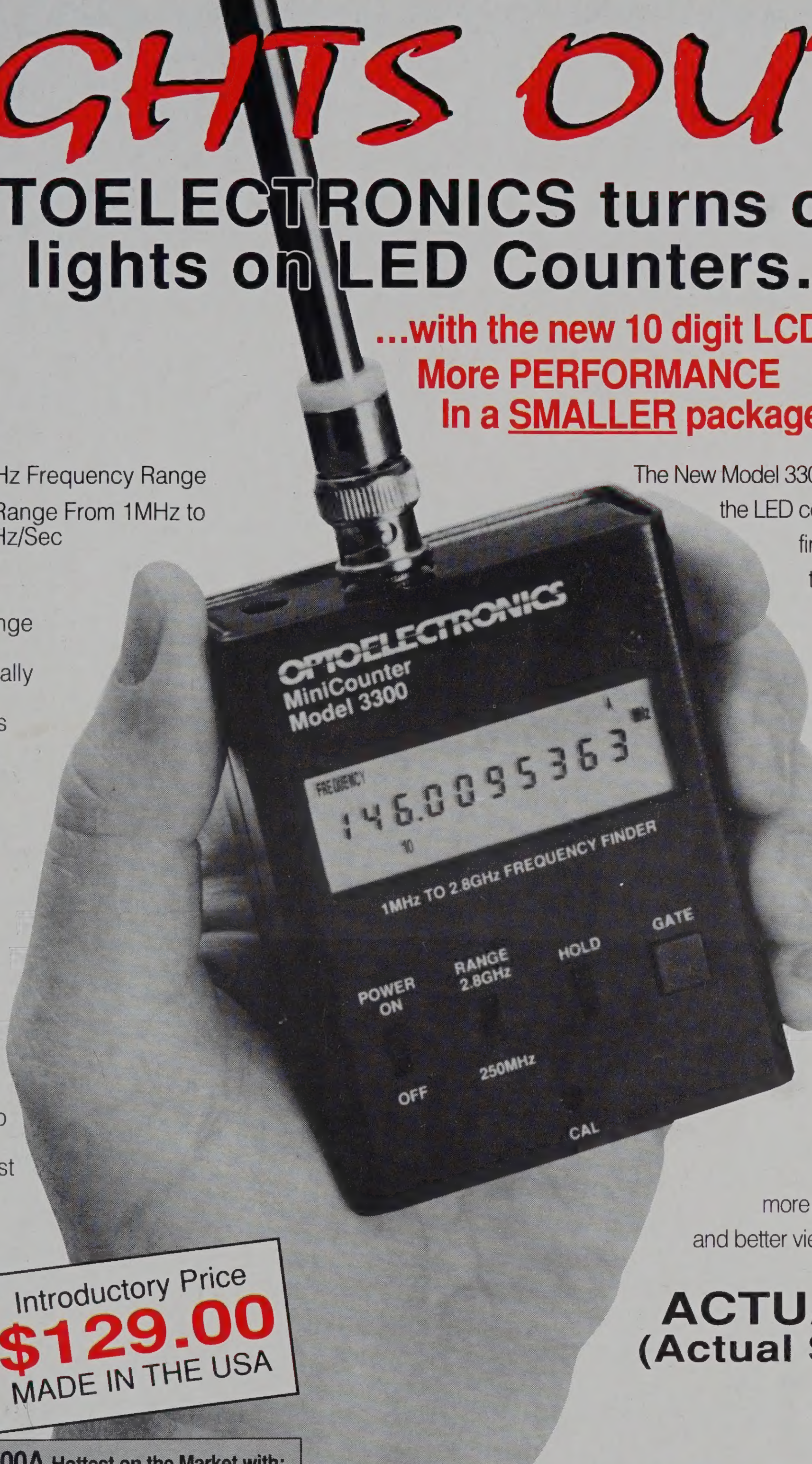
If your mailing label does not include a NARA membership number, this may be your last or only copy of *The Amateur Radio Communicator*. We would like to continue providing you with this informative publication, but we can only do so if you are a member of NARA. For those interested in becoming a ham, or who are newly licensed, a membership in NARA represents an outstanding bargain. A membership, which includes a subscription to *The Amateur Radio Communicator*, is only $10.00 per year.

Check the mailing label for your membership number. If you don't see one, look at the NARA advertisement and read the benefits of becoming a member of this fast-growing organization. We need your support and so does ham radio. Help us get it "going and growing!"

LIGHTS OUT!!

OPTOELECTRONICS turns out the lights on LED Counters...

...with the new 10 digit LCD MiniCounter.
More PERFORMANCE
In a SMALLER package



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The New Model 3300 MiniCounter breaks the LED counter tradition. From our first Model FC50 (1976) to our latest Model 2300, we have always had quality LED counters. But LEDs are power hungry, failure prone and unreadable in sun light. So the LED counter has now gone the way of the LED wristwatch—replaced by LCD. The LCD advantages include lower power, better reliability, smaller package, more information displayed and better viewing characteristics.

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Slim, compact, lightweight. These words describe the exterior of the new TH-22AT Series HTs. Rugged, innovative, sturdy. These words describe what is on the inside. Because along with the beauty, this new series of HT has all the things you want in a portable communications package. Like a streamlined, easy to program interface, one touch controls, and a simplified menu of functions that you can customize to suit your needs. Even a DTMF memory that stores five of your favorite 15 - digit telephone numbers for autopatch use. Wide band receive - 136 to 173.99 MHz. A new innovative microprocessor and final amplifier circuit enables a full five watts, while conserving battery power. (The supplied battery provides **3 watts**.) Easy mobile operation with optional PG-3H cable.

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